

**PM's electric-car contest: Win this chassis**

AUGUST 1975 75 CENTS

# Popular Mechanics



**DESIGN A BODY**

**COMPLETE PLANS: 9 easy yard glamorizers—lights, screens, planters, storage**

**AMC PACER: Exclusive PM Owners Report**

**Copy your color slides**

**How to strip new cars down to old prices**

**KITS: Sailplane, sailboat fun by radio control**

**SECRETS OF  
HIGH-PERFORMANCE  
DRIVING IN A SMALL CAR**



# Winston's box makes a difference.

The box fits in my jeans or jacket and doesn't get crushed. That makes a difference.

Winston's taste makes a real difference, too. No cigarette gives me more taste. For me, Winston is for real.

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.

10 mg. "tar", 1.3 mg. nicotine av. per cigarette, FTC Report MAR. '75.



# WORTH IT?

*"That's for sure!"*

*Out here a hunt sometimes boils down to just one shot. For 27 years I've counted on Super-X® ammunition to make that shot count. It has never let me down."*

*Cotton Gordon*

Cotton Gordon, Guide and Outfitter, Lake George, Colorado



Cotton Gordon's Tarryall River Ranch has been the start of many a successful hunting trip for mule deer, elk, bighorn sheep, bear, mountain lion and antelope. A guide and outfitter in the Central Colorado area for the past 14 years, Cotton is president of the International Professional Hunters' Association and a past president of the Colorado Guides and Outfitters Association.

**Power. Performance. Precision. Plus over a century of experience.**  
The reasons the professionals think Winchester or Western center fire ammunition is "worth it".

When you are after game you may have waited years to see you have a lot to think about without worrying about the reliability, accuracy and striking power of your ammunition. At Winchester-Western we know what you are up against. And for over 100 years we have been making every center fire cartridge knowing that the success of your hunting trip could depend on just one shot. This is one of the big reasons why experienced big game hunters and professional guides and outfitters feel that Winchester or Western Super-X ammunition is "worth it".

Other reasons include:

**Widest selection.** There are almost 100 combinations of bullet type and weight, in over 40 calibers to match virtually every game and hunting condition.

**Custom-matched.** Winchester or Western Silvertip®, Power-Point® and Positive Expanding Point (P.E.P.) are excellent examples of Super-X cartridges customized to suit the game you are after. Power Point combines the quick release impact devel-

oped by a soft point bullet with a jacket designed for controlled, uniform expansion and energy release; Silvertip is for heavier game where penetration prior to expansion and energy release is desired; Positive Expanding Point offers maximum upset and superior accuracy when you are after lighter game.

**Quality components.** Accuracy and performance start with the finest quality-matched components. Cases and bullet jackets are fabricated from brass, custom-formulated in our own brass mill. Forming and assembly operations are performed on precision equipment under rigid quality inspection and testing procedures to assure close tolerances and high strength. The propellant is clean, progressive-burning, smokeless powder. The primer is non-corrosive and designed for positive all-weather ignition.

To help make sure your hunting trip is "worth it" this year take Super-X cartridges along with you. See your Winchester or Western dealer before you leave.

**WINCHESTER-Western.**

## Special Offer.



Metal reproduction of 1913 Winchester store sign, never before offered to the public. Created from the classic painting by well known artist Alexander Pope. Measures 28 1/4" high by 23 1/4" wide. Comes ready for hanging. Send \$12.95 and either two tops from any Winchester or Western ammunition box or an end label from any Winchester firearm carton. No cash or C.O.D. Allow at least 30 days for delivery. Offer expires March 31, 1976. Connecticut residents add sales tax. U.S. residents only please. Winchester Antique Sign, 275 Winchester Avenue, New Haven, CT 06504. Attn: Dept. 328.





## AUTOMOBILES AND BIKES

- 14 [Detroit Listening Post](#)
- 36 [Build the mini-Indy racer](#)
- 39 [How to stay alive in a small car](#)
- 45 [Preview of Detroit's '76 models](#)
- 46 [PM's design-a-body contest: Win this electric-car chassis](#)
- 47 [Road-testing the electric car](#)
- 52 [PM Owners Report: AMC Pacer](#)
- 60 [How to buy a new car at old prices](#)
- 75 [Driving Subaru's 4wd station wagon](#)
- 80 [Saturday Mechanic: It's about time you bought a torque wrench](#)
- 98 [Imports and Motorsports](#)

## HOME AND YARD

- 51 [Plant this \\$60 sprinkler system in just four hours](#)
- 55 [Patio putting green](#)
- 59 [PM visits a house full of energy-saving ideas](#)
- 78 [How to build brick and masonry steps](#)
- 84 [Inside tips to protect outside surfaces](#)
- 85 [New water-based varnish: boon to home finishers](#)
- 86 [New vinyl flooring forgives mistakes](#)
- 90 [Patio partners you can make](#)

## SCIENCE AND ENGINEERING

- 48 [How science sees with sound](#)
- 56 [The training is tough, but so is the work: offshore diving](#)
- 59 [PM visits a house full of energy-saving ideas](#)

## BOATING, OUTDOORS

- 42 [Radio control without the roar](#)
- 62 [Archery today: more strings attached.](#)
- 68 [Big bargains in little boats](#)
- 68 [Port for peak performance](#)

## SHOP AND CRAFTS

- 36 [Build the mini-Indy racer](#)
- 76 [Deburring jig makes saw cut smoother](#)
- 86 [B&D's new portable work center](#)
- 116 [Workshop quickie, Jam paddle](#)

## PHOTOGRAPHY

- 64 [Copy your slides at home . . . and improve them](#)
- 102 [Photo hints](#)

## ELECTRONICS, RADIO, TV

- 42 [Radio control without the roar](#)
- 82 [Ssssh! Noise reducers at work](#)

## EVERY MONTH

- 5 [Letters](#)
- 12 [Appliance Clinic](#)
- 16 [All Outdoors](#)
- 22 [Car Clinic](#)
- 33 [Homeowners' Clinic](#)
- 34 [Science Worldwide](#)
- 70 [It's New Now](#)
- 104 [The Bicycle Shop](#)

## ON THE COVER

Know the secrets of high-performance driving that will help you stay alive in a small car. *Illustration: Roy Grinnell*

AS A SERVICE TO READERS, *Popular Mechanics* publishes newsworthy products, techniques and scientific and technological developments. Due to possible variance in the quality and condition of materials and workmanship, *Popular Mechanics* cannot assume responsibility for proper application of techniques or proper and safe functioning of manufactured products or reader-built projects resulting from plans published in this magazine.

# Popular Mechanics®

AUGUST 1975 • Vol. 144 No. 2

INTERNATIONAL EDITIONS: Australia, Caribbean, Mexico, Southern Hemisphere

## SPECIAL FEATURES:

**PM'S design-a-body contest.** You'll win a \$1700 Elcar Model 2000 electric-car chassis if you submit the winning car-body design for it. Page 46.

**Nine patio partners you can make**—complete plans given for five planters, grille fence, storage gazebo, hanging lamp and view divider. Page 90.

**American Motors Pacer:** Drivers plain-talk their likes and dislikes in PM's exclusive Owners Report based on a million owner-driven miles. Page 52.

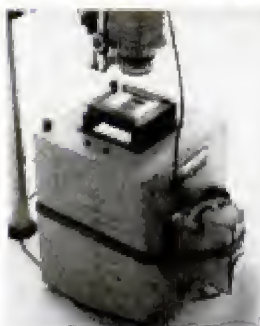
**Copy your color slides at home . . .** and improve them by making better pictures from those slides that didn't quite make it originally. Page 64.

**How to strip new cars down to old prices.** You can save up to \$1000 if you install some extras yourself and skip others you may never want. Page 60.

**Radio control without the roar.** Kit-built, wind-powered R/C model sailboats and sailplanes offer quiet excitement on water and in the air. Page 42.



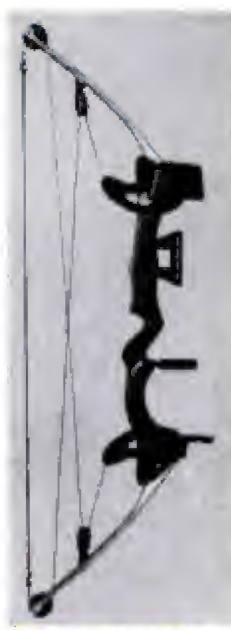
Pacer report, page 52



Make color slides page 64



Diving school, page 56



Archery, page 62

**SUBSCRIPTION SERVICE:** Mail all subscription orders, changes of address with your latest label, to *Popular Mechanics*, P.O. Box 646, New York, N.Y. 10019. All other correspondence relating to your subscription: James Gable, Customer Service Department, *Popular Mechanics*, P.O. Box 1567, New York, N.Y. 10019.

**POPULAR MECHANICS IS PUBLISHED MONTHLY** by the Hearst Corporation, 224 West 57th Street, New York, N.Y. 10019, U.S.A. Single copy for the United States and Canada, 75 cents. Subscription prices: United States and Possessions, \$7.00 for one year; \$13.00 for two years; \$18.00 for three years. Canada, add \$3.00 for each year. All other countries, add \$5.00 for each year. Second-class postage paid at New York, N.Y., and at additional mailing offices. Authorized as second-class mail by the Post Office Department, Ottawa, and for payment of postage in cash. Registered as second-class matter at the Post Office at Mexico D.F., Mexico, June 20, 1950. © 1975 by The Hearst Corporation. All rights reserved. Printed in U.S.A.

**POSTMASTER:** Please send Form 3679 to *Popular Mechanics*, P.O. Box 646, New York, N.Y. 10019.



**FOR ABOUT  
500,000 YEARS  
MAN HAS TRIED TO BE  
MASTER OF THE WATER.  
NOW HE HAS THE  
UPPER HAND.**



This One



F9A8-ZUY-NRKQ

**BLACK MAX<sup>TM</sup>  
IS COMING  
FROM MERCURY<sup>®</sup>**



**BC**

A BRUNSWICK COMPANY



# Learn appliance repair to save money or start a part-time business...



## Send now for this free NRI catalog.

### Train at home in your spare time with this short, easy course

NRI can prepare you quickly to do professional appliance servicing for extra income, or to save money on your own appliance repairs. You can finish the course in a matter of months, learning by easy step-by-step bites. And you even get your

own professional appliance tester at no extra cost.

Over a million students have enrolled with NRI, and that's your assurance of expert training from the basics right through to on-the-job troubleshooting. Mail the coupon today for your free NRI catalog. No salesman will call.

### RUSH FOR FREE CATALOG



**NRI SCHOOLS**  
McGraw-Hill Continuing Education Center  
3939 Wisconsin Avenue,  
Washington, D.C. 20016

Rush me your illustrated free book that tells about opportunities in servicing Electrical Appliances and gives details of NRI's simplified training plan. I understand there is no obligation, and NO SALESMAN WILL CALL.

600-085

☐ Approved for Career training under G.I. Bill. Check for facts.

Name  Age

Address

City  State  Zip

ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

## Popular Mechanics®

**JOHN A. LINKLETTER**  
Editor

**SHELDON M. GALLAGHER**  
Executive Editor

**DANIEL C. FALES**  
Managing Editor

**WAYNE C. LECKEY**  
Home and Shop Editor

**ALVIN KIETZ**  
Art Director

**BILL HARTFORD**  
Automotive

**JOHN F. PEARSON**  
Science and Engineering

**WM. T. McKEOWN**  
Boating, Outdoors and Travel

**IVAN BERGER**  
Electronics and Photography

**HARRY WICKS**  
Home Workshop

**STEPHEN WALTON**  
Assistant, Home and Shop

**MICHAEL LAMM**  
West Coast

**ROBERT LUND**  
Detroit Automotive

**GARRY WINTER**  
Copy Chief

**RICHARD H. FUNK**  
Production

**ALFREDO VEGA**  
Assistant, Production

**DAVID KOMITAU**  
Assistant Art Director

**IRA HERRICK**  
Assistant Art Director

**DON L. MANNES**  
Assistant Art Director

**ED MENTKEN**  
Assistant Art Director

**CLIFFORD B. HICKS**  
Special Publications

**LUDWIG ARONS**  
Special Projects

**SOPHIE GRONOWICZ**  
Director, Bureau of Information

**EVERETT JOHNSON**  
Cabinetmaker

**DANIEL J. COLEMAN**  
Director of Advertising

**ADVERTISING OFFICES:** New York: 224 W. 57th St., 262-4282; Chicago: 520 N. Michigan Ave., 627-2400; Detroit: General Motors Bldg., TRinity 5-8711; Cleveland: 20310 Chagrin Blvd., Shaker Heights, Ohio, 283-7788; Los Angeles: 601 N. Vermont Ave., 666-6263.

**JOHN A. REGINA**  
Advertising Production Manager

Published by The Hearst Corporation

**JOHN R. MILLER**  
President

**RANDOLPH A. HEARST**  
Chairman

**RICHARD E. DEEMS**  
President, Magazines Division

**JOSEPH F. KERN**  
Publisher

**POPULAR MECHANICS IS PUBLISHED MONTHLY** by the Hearst Corporation, 224 West 57th Street, New York, N.Y. 10019, U.S.A., John R. Miller, President; Randolph A. Hearst, Chairman; Harrison A. Mitnick, Treasurer; Harvey L. Lipton, Vice President and Secretary, Hearst Magazines Division; Richard E. Deems, President; Gilbert C. Maurer, Executive Vice President, Operations; Raymond J. Peterson, Executive Vice President, Advertising; William S. Campbell, Vice President and General Manager; John F. D'Avolio, Vice President and Resident Controller; Albert A. Rachol, Vice President and Director of Circulation; Joseph F. Kern, Vice President for Popular Mechanics.

**ADDRESS ALL EDITORIAL COMMUNICATIONS** to 224 West 57th St., New York, N.Y. 10019. For additional sources of information on the articles and products in this issue, write to the Bureau of Information, Popular Mechanics, for free "Where-to-Find-It" List.



# LETTERS

## TO THE EDITOR

### Transatlantic balloon

Readers of my article, *Transatlantic Balloon Jinx* (page 70, June '75) may be interested in the latest feat of Bob Sparks, who will try again this summer to fly a gas balloon across the Atlantic. On June 9, he made aviation history as the first to balloon over all five Great Lakes. Sparks flew the 75,000-cubic-foot Lark hot-air balloon (of cigaret ad fame) in these lake crossings as a warm-up for his upcoming transatlantic flight.

PAUL WAHL  
TEANECK, N.J.

### Who goes into space?

Your article *Cities in the Sky* (page 94, May '75) leaves some important questions unanswered. You say that the planners intend "to put entire human colonies into orbiting space habitats." Somehow I get the uneasy feeling that those doing the putting intend to stay here on dirty, noisy old earth.

Are those who will be "put" in outer space to be sent willingly or against their will?

LEO D. PATTERSON  
BURLINGTON, W.VA.

### Don't forget North Dakota

As a former North Dakotan who has enjoyed many lovely summers in the Peace Garden State, I read *257 Close-to-Home Vacationlands* (page 56, June '75) with considerable dismay. In the illustrated pages of the 50 states, only North Dakota was completely blocked out by a picture, giving the vacationing public the impression there is nothing to see or do in that state.

There are many state and federal campgrounds; Lake Sakakawea boasts excellent fishing, boating and resort areas, and the Badlands with its array of colors and panoramic view near the Theodore Roosevelt National Memorial Park is a scene never forgotten by the tourist.

Throughout the state are the friendly people ready to welcome you in the great traditions of the old West. I enjoy my adopted state of Montana, but let's not forget North Dakota.

LAVERNE CARROLL  
DILLON, MONT.

### New hope: new engine

Your article *A New Engine Can Save Old Betsy* (page 74, June '75) really hit the spot. I've had rebuilt engines put in two cars (a '39 Dodge and a '40 Chevrolet) and really had good results with them. Strange when I did it all people would tell you was it wasn't worth it. Or you'd never get the money out of the car when you sell it. I always figured it was the value to me and not whoever had the car after me. It is worth it!

JOHN L. CARLSON  
SEATTLE, WASH.

The article gave me new hope that I can still afford a tow unit for full-time trailering when I retire soon by renewing the engine in my '67 Olds but the article did not mention the automatic transmission, the rear end, etc. My question—can these components last through a second engine without being renewed themselves?

GEORGE LANCASTER  
OAKRIDGE, ORE.

*They can fail, too. But replace them as necessary, not when you're doing the engine.*

### Fabulous phono cartridges

*Fabulous Phono Cartridges* (page 66, April '75) was very informative, especially in showing how discrete four-channel phono systems work using the new quadradiscs.

Can you answer a question about matrix phono systems? I've read that the different companies use different decoders and that you must use their own records or four channels will not be produced correctly with all channels in their right position. Is this true or are all companies using universal decoder?

DICK CAVENDER  
PORTLAND, ORE.

*There are two matrix systems in use: the QS system (originated by Sansui), which is sometimes called "RM"; and the SQ system originated by CBS. Decoders for one will yield inaccurate, but interesting, four-channel results from records made for the other—and will yield similar results from stereo records. As of this writing, SQ records are more*

*(Please turn to page 5)*

# Two more ways to be a hero in your own home!



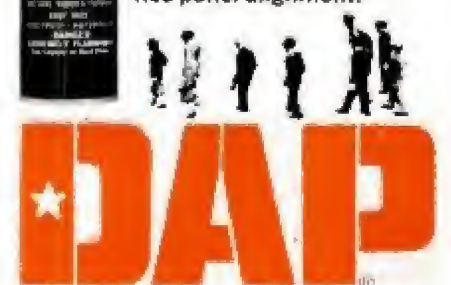
## Patch a wall

Make invisible repairs to plaster and drywall with DAP Vinyl Paste Spackling Compound. Spreads smoothly. Fills fine line cracks and large holes. Dries fast, sands to a feather edge. Takes paint perfectly.



## Panel a room

It's easy when you use DAP Panel and Dry Wall Adhesive. It saves time and work. Fastens paneling and wallboard to studs and furring faster, easier than nailing. Simplifies panel alignment.



## The name people know best in home fix-up

DAP Inc., General Offices: Dayton, Ohio 45401  
Subsidiary of Plough, Inc.



## Eight K Models:

# Because all animals are not created equal.



A deer at 50 yards is not the same as a deer at 200 yards. And a bear isn't like a sheep.

So Weaver gives you a choice of eight all-steel K Models. From 1.5-power to 12-power. All are precision instruments. From a superior Weaver-made optical system to the finest fogproofing available in any scope. Weaver K's are guaranteed fogproof for the life of the scope.

Ask your dealer for any of the K Models. Or write for free color catalog that shows Wider-Views, K Models, V Models, 22 Scopes, Qwik-Points. W. R. Weaver Company, Dept. 91, El Paso, Texas 79915.

**WEAVER SCOPES**  
The Great American Scope.



AIR CONDITIONER

Save fuel . . . stay cooler . . . with the E-M Cold Air Shield™

By trapping cold air in the front seat, the E-M Cold Air Shield gets you cool quicker at less cost. Saves 2 miles or more per gallon of gas. Installs in 30 minutes. Rolls up or down in seconds. Fits all American cars. Heavy clear vinyl permits full rear-viewing and use of seat belts. All hardware, instructions furnished. Fully Guaranteed! Get cooler soon. Return check or money order today. Satisfaction or your money returned.

To: E-M Cold Air Shield Co.  
P. O. Box 908 Rosman, N. C. 28772  
☐ Please send \_\_\_\_\_ E-M Cold Air Shields at \$9.95 each plus \$2.00 for shipping and handling. No COD's please.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City, State, ZIP \_\_\_\_\_  
Car: Make \_\_\_\_\_ Model \_\_\_\_\_ Year \_\_\_\_\_  
©Copyright 1975, E-M Cold Air Shield Co.

Who else WANTS to be a LOCKSMITH?  
Train FAST at Home. It's EASY Making Up to \$10 an Hour—even while learning!

If you enjoy fixing things, you're a "natural" to make hundreds of EXTRA DOLLARS a year in the fascinating business of Locksmithing. Rising crime has increased demand for service a thousandfold. Yet there's only one Locksmith for every 17,000 people! COLLECT CASH PROFITS ALMOST AT ONCE! You're "in business" ready to make \$5 to \$10 an hour a few days after you begin Belsaw's shortcut training. Easy, illustrated lessons complete with ALL practice equipment PLUS KEY MACHINE YOURS TO KEEP enable you to get your share of this always-profitable business. Hundreds we've trained are doing it. So can YOU.

Mail coupon for FREE facts—No Salesman Will Call



YOURS TO KEEP

Accredited Member  
Nat'l Home Study  
Council,  
Approved for Vets.

**BELSAW INSTITUTE**  
106P Field Bldg.,  
Kansas City, Mo. 64111

**BELSAW INSTITUTE**  
106P Field Bldg., Kansas City, Mo. 64111  
Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
☐ Check here if eligible Veteran

## LETTERS

(Continued from page 5)

common than QS. An exact rundown of what's available can be found in the front of the current Schwann record catalog, at most record stores.

## Scanners

In regard to your article on *Scanners* (page 95, June '75), we have a Glad-ding Cheyenne 8. We didn't care much for the bands between 150-174 Mhz, so we had the set tuned down to 145-149 Mhz. We really enjoy listening to these "ham" bands. Anyway, I thought you might like to know that some of the better scanners can be retuned to different bands.

DON CRUMPTON  
EL CAJON, CALIF.

You made an error in printing the *National 10 Codes*. These are obsolete! The danger comes from the very fact, as you pointed out, that various departments assign different meanings to the same signal. To eliminate this danger, the Associated Public-Safety Communications Officers, Inc. (APCO) developed the APCO Brevity Code of 10 Signals.

We would appreciate it if you would print the code. This will contribute to complete understanding when several departments are involved in mutual disaster aid.

EUGENE S. GOEBEL, CHAIRMAN  
EMERGENCY PREPAREDNESS AND  
DISASTER OPERATIONS COMMITTEE  
APCO  
SPRINGFIELD, ILL.

Here's the APCO Brevity Code of 10 Signals:

- 10-1 Signal weak/change location
- 10-2 Signal good—continue
- 10-3 Radio silence/stop transmitting
- 10-4 Affirmative—acknowledgement  
—O.K.
- 10-5 Relay (to) \_\_\_\_\_
- 10-6 Busy
- 10-7 Out of service/ (at \_\_\_\_\_)
- 10-8 In service/ (at \_\_\_\_\_)
- 10-9 Say again—repeat
- 10-10 Negative/denied
- 10-11 \_\_\_\_\_ On duty/who is on duty?
- 10-12 Standby (stop)
- 10-13 Existing conditions
- 10-14 Message/information
- 10-15 Message delivered
- 10-16 Reply to message \_\_\_\_\_
- 10-17 Enroute to assignment
- 10-18 Urgent
- 10-19 In contact with \_\_\_\_\_  
are you in contact with \_\_\_\_\_
- 10-20 Location
- 10-21 Call \_\_\_\_\_ by phone  
(at or number \_\_\_\_\_)
- 10-22 Disregard/cancel
- 10-23 Arrived at scene
- 10-24 Assignment completed
- 10-25 Report to (meet) \_\_\_\_\_
- 10-26 Estimated time of arrival
- 10-27 License/permit information
- 10-28 Ownership information
- 10-29 Records check
- 10-30 Danger/caution
- 10-31 Pick up \_\_\_\_\_
- 10-32 \_\_\_\_\_ Units needed (specify)  
(fire units, ambulance units,  
police units)
- 10-33 Help me quick
- 10-34 Time
- 10-35 through 10-39 Held for  
future: Do Not Use

★ ★ ★



# Trade-in times demand a clean start for new engine life



## Fill up with Castrol GTX Motor Oil

*Castrol  
Expertise  
in  
Lubrication*

Available in SAE 10W/40,  
10W/50 and 20W/50



Burmah-Castrol Inc. Member Burmah Group  
Hackensack, New Jersey 07601







Wm. D.

Electric

NORRISTOWN

Electric HEATING CONTRACTOR

FLAMELESS  
ELECTRIC HEAT

CALL US FOR  
AND AN



# "Learn an honest trade," my old man used to say, "and you'll never have to knuckle under to any man."

(A TRUE STORY)

Bill De Medio of Conshohocken, Pa., has it made.

At 26, he's a licensed master electrician. The top of a trade where there aren't enough good men to go around.

But more important, Bill's his own boss and calls his own shots.

"I just went into my own business. And even before the sign on my truck was dry, I got my first big job.

"The contractor for a new group of houses asked me to do all the wiring. And there's bound to be a lot more work from him and other builders.

"If it wasn't for my ICS training as an electrician, I'd still be in some dead-end job—hating what I was doing, taking orders from everyone, and never getting any thanks for it.

"As a master electrician, you're the boss on the job—even when you're working for someone. You get respect, good money, and like my old man said, you don't have to take baloney from anyone."

## The right combination for success

Bill De Medio is one of our outstanding graduates. He's hard working. He's in a growing field. And he has good training.

Of course, we can't promise you'll be as successful as Bill—no school can guarantee jobs for its graduates. ICS can't make you smarter than you already are, and we can't make you ambitious if you're lazy.

But ICS can give you the first-rate training you need—especially if you're interested in one of the growing careers where ICS concentrates its training. Like Electrician. Engineer. Auto Mechanic. TV Repairman. Draftsman. Air Conditioning Serviceman. (Check your choice on the attached card.)

## An ideal way to learn

As an ICS student, you study at home, on your own schedule. You waste no time traveling to and from class. And you never have to miss a paycheck.

But you're never alone. Skilled instructors are always ready to help you.

If you ever have doubts or problems or just want to talk to an instructor, you can call ICS from anywhere in the continental United States, day or night, using our special toll-free Dial-a-Question® service.

## ICS training works

Since 1890, millions of men and women around the world have turned to ICS for career training.

More than 70 of America's largest 100 corporations (including Ford, U.S. Steel, Mobil Oil, GE and RCA) use ICS training for their own employees.

And the ICS Center for Degree Studies is authorized by the Pennsylvania Department of Education to award the Associate in Specialized Business Degree in Accounting and Business Management. These are 2-year college degree programs available entirely through home study.

## Free Demonstration Lesson

If you want more—more money, more security, more day-to-day satisfaction and more future—our free Career Guidance Booklet and free Demonstration Lesson can help you get started in the right direction. Just check the box next to the field that interests you most and mail the postpaid card today. There's no obligation.

Remember, it's your life. You might as well make the most of it.

©1975 Intext, Inc.

E

**ICS** International Correspondence Schools  
Scranton, Pa. 18515

XA808G

Please mail me the Free Career Guidance Booklet and Free Demonstration Lesson for the field I have checked below. I understand I am under no obligation.

- |   |  |
|---|--|
| <input type="checkbox"/> Electrician                      | <input type="checkbox"/> Automotive Mechanics    |
| <input type="checkbox"/> Engineering                      | <input type="checkbox"/> Business Management     |
| <input type="checkbox"/> Accounting                       | <input type="checkbox"/> Civil Engineering       |
| <input type="checkbox"/> Drafting                         | <input type="checkbox"/> Interior Decorating     |
| <input type="checkbox"/> Electronics Technician           | <input type="checkbox"/> Restaurant/ Club Mgt.   |
| <input type="checkbox"/> TV Service & Repair              | <input type="checkbox"/> Income Tax              |
| <input type="checkbox"/> Airline/Travel                   | <input type="checkbox"/> Motel/Hotel Mgt.        |
| <input type="checkbox"/> Surveying & Mapping              | <input type="checkbox"/> Mechanical Engineering  |
| <input type="checkbox"/> Construction Electrician         | <input type="checkbox"/> ICS High School Diploma |
| <input type="checkbox"/> Diesel Mechanic                  | <input type="checkbox"/> High School Equivalency |
| <input type="checkbox"/> Air Conditioning & Refrigeration |  |

Name \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Telephone \_\_\_\_\_

## Earn a college degree

The ICS Center for Degree Studies is authorized by the Pennsylvania Department of Education to offer college programs at home leading to Associate in Specialized Business Degrees. For more information at no cost or obligation, check the degree of your choice.

- ☐ Accounting Degree  
☐ Business Management Degree

Canadian residents use Scranton, Pa. address for service from ICS Canadian, Ltd. In Hawaii: 931 University Ave., Honolulu, Hawaii 96814

APPROVED FOR VETERANS' TRAINING.  
APPROVED FOR FEDERALLY INSURED STUDENT LOANS.  
ACCREDITED MEMBER NATIONAL HOME STUDY COUNCIL

At 26, Bill De Medio has more freedom, more security, and gets more respect than guys twice his age. (Photograph by Frank Cousin.)





# APPLIANCE CLINIC

BY PAUL MANN

## Sudden spots

*Our General Electric Filter-Flo washing machine (Model 1WA850A5W) worked perfectly for nine years. Suddenly, six months ago, clothes started coming out with grayish-white spots on them. The machine works fine and the water we're using is the same. I removed hoses and water pump on the chance that something was in them, but there wasn't anything. We have tried all different kinds of detergents. What now?—Ben Sernentilli Jr., Enfield, Conn.*

I've received more than one letter like yours. GE and other manufacturers note that this is a widespread condition in areas where phosphate detergents have been banned. One company spokesman told me, "Detergents without phosphates in them, especially in the Northeast, are raising hell with washability."

At this point, the only thing I can suggest is that you try adding a water softener, such as Calgon, to the detergent. This appears to help to some extent.

## Renaissance revival

*We have a Renaissance model Tappan gas range, about six or seven years old. It's a fine unit, but last month everything electrical quit—timed outlet, oven light, timer, clock, fluorescent fixture, you name it. Is there a fuse that controls all this? If so, where is it?—E. B. Gajewski, Buffalo.*

There is a fuse, but it controls only the timed outlet, and so has nothing to do with your trouble. The problem must lie somewhere between the wall outlet and the terminal block behind the range panel, into which the line cord connects.

Check that the wall receptacle is live by unplugging the range and plugging in a lamp you know is working. Next, check the line-cord plug, especially for a break in the wire where plug and cord connect. A slit here often goes unnoticed. Then make sure the plug is making good contact in the receptacle. Spread prongs slightly for a tight fit.

After this, test the line cord itself. Remove the range panel to reach the terminal block. See that the cord has not pulled loose from the terminals. Disconnect cord from the terminal

block, making sure it's not plugged into the receptacle. Twist its ends together and use a continuity tester across the plug prongs. If the cord doesn't show continuity, replace it.

## More on the manifold

*Your item in the April '75 Appliance Clinic entitled Washer Perplexity concerned a 1960 RCA Whirlpool Imperial clothes washer that drained properly after the wash cycle but left water in the tub after the spin cycle. You advised M. P. DeCruyenaere to disconnect and clean out the manifold (pump guard). I'm a factory-trained Whirlpool serviceman and I commend you for your diagnosis. Not too many people know about this. However, allow me to stress one important point. The manifold has a baffle under the outlet. In this baffle is a breather hole about 1/16 in. in diameter. This hole must be open or the problem will continue.—Lawrence Aaron, Atlanta, Ga.*

Thanks for the kind words and advice. Both are welcome.

## Hamstrung

*I have a Westinghouse electric slicing knife. My wife tried to carve a partly frozen ham with it and broke the small plastic gear that moves the knives back and forth. Is this gear replaceable? Where can I get it? How much does it cost?—Keith German, St. Louis.*

The gear is replaceable—through a Westinghouse dealer or write to Westinghouse Parts Div., 1300 Belmont Ave., Philadelphia, Pa. 19104. Cost should be less than \$1.

## Stalled spin

*I have too much money invested in my Maytag washing machine to get rid of it. This top-filled model is stalling at the start of the spin cycle. I can get it spinning by grabbing the pulleys and pulling them back. Servicemen have replaced belts, checked the clutch, replaced the timer, tightened wires, and made all sorts of tests. My tab for service calls is nearly \$75. Now they tell me I need a new transmission. What should I do?—Stanley Wright, Modesto, Calif.*

Here's another thing to check before installing a new transmission.

When this machine shifts into spin, the motor reverses itself and pulls on the loose side of the belt, allowing it to slip until the tub gets up to full speed. If your model is like others, the motor is mounted on four plastic rollers, each the diameter of a nickel but about three times as thick. In time, these rollers can flatten, preventing the motor from reversing. Then, in essence, the motor stalls and the tub remains at a standstill.

After all you have been through, the solution may be nothing more complicated than replacement of the rollers. But let me give you a tip: Have a machinist make rollers for you from brass, instead of buying the plastic ones.

## Gummed-up works

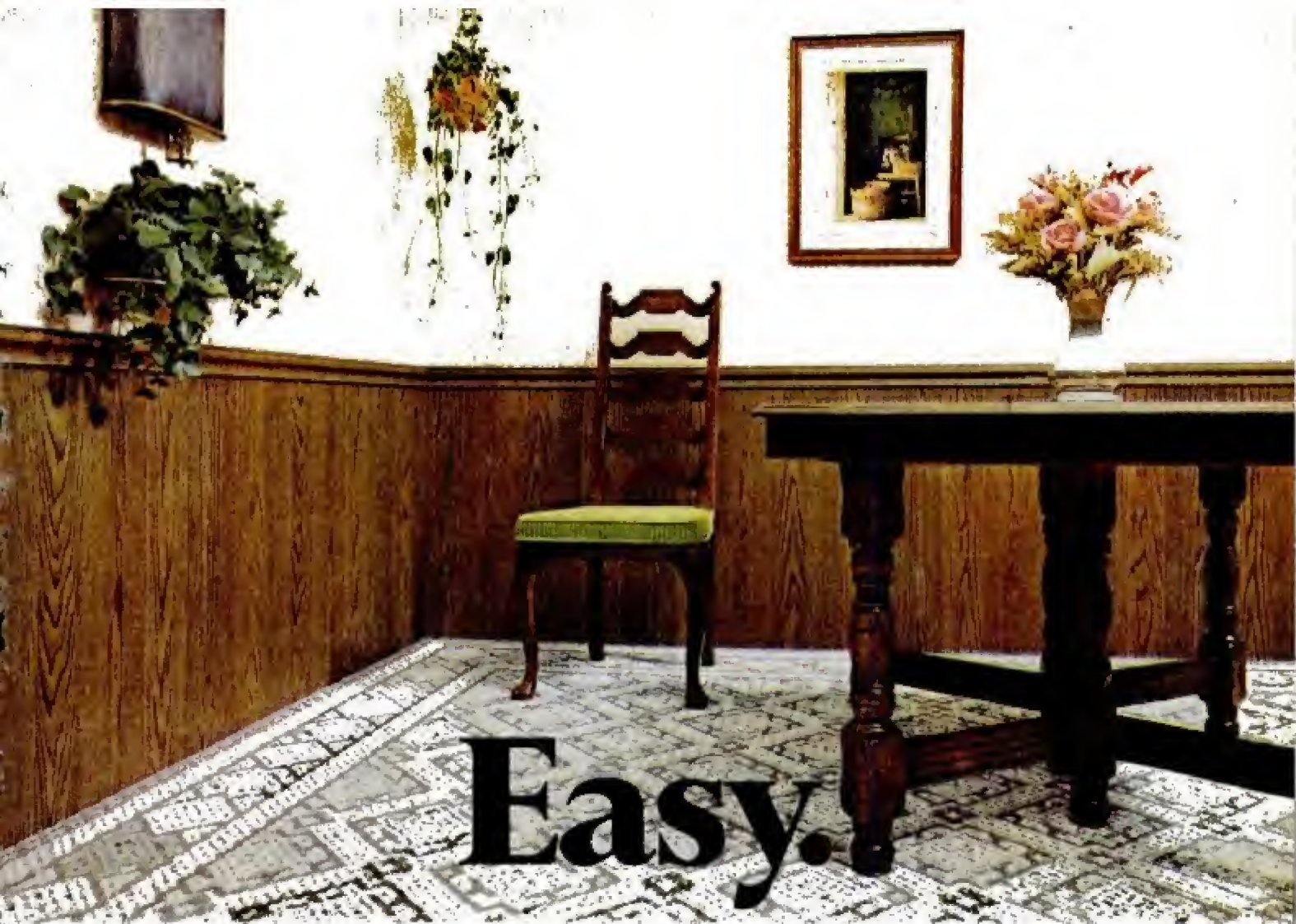
*We have a General Electric dishwasher (Model SD200B2) which absolutely refuses to dispense detergent from its cup. The dispenser works, opening properly, but the detergent stays inside, gumming up into a semisolid mushy lump that won't wash out. To operate the unit, we must stop it and throw in a handful of detergent, then restart the dishwasher. Everything works well and dishes come clean. We have tried every detergent on the market. What's wrong with our pot scrubber?—George Kenoszt, Elmhurst, Ill.*

Mechanically? Probably nothing. The dispenser is opening and there is no flaw in the cycle, because dishes are coming clean. The trouble, I suspect, is operational, and the solution is probably very simple. See that water is hot enough. Detergent may not dissolve in water that is cooler than 150° F.

If water temperature is okay, see that no dishware is placed in front of the dispenser. It's possible that whoever is loading the appliance is blocking water from the dispenser. Some water is getting through, accounting for the gummy mush, but detergent needs a full blast. ★ ★ ★

*If you have a question about any appliance, send it to Appliance Clinic, Popular Mechanics, 224 West 57th St., New York, N. Y. 10019. Sorry, but letters cannot be answered individually. Problems of wide interest will be discussed in this column.*





# Easy.

Do it. Wainscot a wall. Turn a run-of-the-mill room into one that has some life. Some character. You can do it in an evening. Do it with the new Marlite Wainscot Kit. Do it with no mess. It's easy!

**The whole kit and caboodle.** The compact Kit has everything you need to wainscot a 12-foot wall: pre-cut 16" x 32" x 1/4" tongue-and-groove planks, harmonizing chair-rail moldings, clips, nails, adhesive and complete installation instructions. All you need is a hammer, a saw, a caulking gun. And a couple of hours!

**Handsome today and tomorrow!** The Marlite Wainscot Kit comes in four

plank designs—colors and textures that will compliment your room and your good taste. And when the wainscot is up, your room is going to look like a million! Better yet, it'll stay that way because Marlite Wainscot planks are for active families—washable, color-fast, too!

Whether you wainscot an entire room or accent a single wall, you'll do it fast and easy with the Marlite Wainscot Kit. See it at your building materials dealer.

**Marlite Wainscot Kit**



**Marlite**

DIVISION OF MASONITE CORPORATION  
Dover, Ohio 44627

Marlite planks are hardboard with man-made finish.

Marlite, Barnside and Masonite are registered trademarks of Masonite Corporation. No. 7601

**Marlite Wainscot Kit**

# Does it!

\*311 Frontier Chapel



\*5115 Gray Barnside



\*3206-S4 Light Roughsawn



\*3003-S2 Shell





# DETROIT LISTENING POST



BY ROBERT LUND

## GM mini ready in September

Chevrolet says all its cars will be introduced simultaneously this fall. This qualifies as news in that it means Chevrolet's new mini will be out in September. Earlier reports were that the car might not be ready for production until the end of the year or early in 1976. Present plans call for the first car to come off the line the third week of this month.

Chevy always tries to keep its new cars under wraps until A-Day (announcement day). As if the division didn't have enough problems trying to keep the cork on the mini, GM has disclosed it is working on an even smaller car—a one-seat, two-person job. This will be a Chevrolet product, although Pontiac will likely have a later-on version. The Chevy original is at least two years away.

## Ford eyeing Spanish import

Ford's immediate response to the Chevrolet mini will be a stripped, lower-priced Pinto this fall. For the longer term, Ford has assigned agents to Spain to check the possibility of bringing a smaller-than-Pinto car in from that country until the company can tool up for a vehicle to counter the GM mini.

Meanwhile, Ford has adopted the code name Fox to cover a complete redo of its existing small cars and development of a new mini. Obviously, Ford won't keep the Fox name when the cars are ready because Audi already has the name. But use of the code name during the development program could be a tip-off that Ford has a high regard for the VW and Porsche/Audi product lines.

## GM-full-sizers will be 118-inches

Cadillac's Seville will not be the largest car in the GM fleet when the company completes resizing its cars over the next two years. Seville has

**Variations on Seville** are in the works for other GM divisions. Here's possible Buick sedan version from drawing board of Harry Bradley. It could be on the market by mid-1976. More '76 Detroit models are shown on page 45.

a wheelbase of 114.3 inches. GM will continue to make a Caddy and at least one car under each of the other nameplates—Buick, Chevrolet, Oldsmobile and Pontiac—with wheelbases of 118 inches.

## Look-alike trend to continue

If you found fault with Detroit in the past for turning out cars that looked like they all came off the same drawing board, you may be even unhappier with cars coming over the next few years. They will be even more look-alike. Small, medium or large, most cars will take on the boxy lines of Ford's Granada/Monarch. You can blame or credit Mercedes for that, because Ford admits it borrowed the shape from Mercedes. Cadillac's Seville came out of the same Xerox machine, although Cadillac argues otherwise.

Don't blame the designers for the lack of distinctiveness and inspiration. Designers have very little to say about how cars look these days. The government tells Detroit what it wants in and on cars and the big wheels at the corporate level tell the designers what kind of box they want to hold the pieces. The designers are working under severe restrictions and limitations. There's very little freedom to exercise imagination—About as much as a kid has who is handed a coloring book and box of crayons and told "go ahead and draw, but stay inside the black lines."

## Ford goal for '76: more MPG

Ford is expected to show greater improvement in gas mileage on its '76 cars than other automakers. Conceding that its '75 cars as a group lag behind GM makes as a group in fuel economy, Ford's goal is to equal or surpass GM's economy numbers on the '76 cars. It is aiming to add two to three miles per gallon for all cars.



## Chevy has Houdini-proof lock

Someone broke into my car last month and tried to start it by jamming a screwdriver in the ignition. They didn't get the car, but they messed it up pretty bad. The screwdriver broke off in the ignition and the starter drive had to be replaced. While the car was being repaired, I borrowed one of the new Monza Towne Coupes from Chevrolet. I put about 250 miles on it and, as small cars go, it's a nice-handling machine. With a V8 engine, it's the zippiest small car I've ever put the pedal to.

But the thing that impressed me most about the Monza TC is where they put the door locks. The locks are the standard push-pull variety, but the button is recessed in the armrest about halfway down the door. The button does not go up and down vertically. It goes back and forth horizontally. On my car, the locks are in the usual position on the edge of the windowsill. It's easy to snake a coat hanger between the glass and the rubber seal and open the lock. You can't do that on the Monza sedan. There's no way of getting a coat hanger or wire in the car and then working it at the necessary angle to open the locks.

Another antitheft feature of the car is the ignition lock system. There's a small lever just under the ignition. The only way you can remove the key from the ignition is to press the lever down while holding the key in the lock position. It's awkward and takes two hands to press the lever and disengage the key. But it's a neat idea because it locks both the ignition and the steering mechanism. The car isn't stealproof, but a thief is going to shop around for an easier car to crack before he tries pinching one with the dual locking device. Chev has the same ignition setup on Vega.

One thing I learned as a result of this experience is how to start my make of car without a key and without crossing the ignition wires. The mechanic who installed the replacement ignition showed me how it's done. The rip-off guy who tried to take my car was obviously an amateur, because you can't start the car with one screwdriver. But it's a snap when you know how. ★★ ★



# Mild. But not Meek.

Because Raleigh always starts with more full flavor than the ordinary cigarette, more flavor comes across in Raleigh Extra Milds.

Mild, yes, because they're lowered tar. But not meek, because they're Raleigh.

# RALEIGH EXTRA MILDs

Warning: The Surgeon General Has Determined That Cigarette Smoking Is Dangerous to Your Health.



Get this Hawkeye Pocket Instamatic Camera by Kodak.

Easy drop-in cartridge loading. Yours for free B&W coupons, the valuable extra on every pack of Raleigh Extra Milds.

To see over 1,000 gifts, write for your free Gift Catalog. Box 12, Louisville, Ky. 40201

Extra Milds, 14 mg. "tar," 0.9 mg. nicotine; Filter Kings, 16 mg. "tar," 1.0 mg. nicotine; Longs, 17 mg. "tar," 1.2 mg. nicotine, av. per cigarette, FTC Report Apr. '75

Manufactured by B&W T Co., Louisville, KY 40201



# ALL OUTDOORS

WITH BILL McKEOWN



## Slicker kickers

Our exclusive preseason previews of next year's outboard motors show some amazing power jumps in the horses packed under the hoods.

Remember a few years ago when rumors went the rounds that some one had an experimental radial outboard that might spin out 100 hp? "But who would need it?" was one question. Since then we've found any boat big enough and well enough put together can use all of the horsepower it can handle from outboard motors and their close first cousins, the versatile stern drives. Lighter weight, tilt-up propellers, easy servicing, better steering, adjustable thrust angle for boat trim, plus poundage placement all the way aft are among advantages of outboards over inboards.

And now Outboard Marine Corp.'s Evinrude and Johnson motors will be making a bigger power increase in one year than they did in their first 50 years. For 1976, both will announce bicentennial 200-hp outboards at the top of their lines, up a magnum 65 hp from this year's 135s. Mercury, already at 150 hp, is rumored to be going up in power as well. Chrysler has a production engine of 135 horses and a racing mill at 150.

As impressive, perhaps, as all this new muscle is the fuel economy reportedly engineered into these big ones. Prototypes we have already test-run show less gas consumption for the same speed as the smaller current models. In some cases, this has also been accomplished with mills of greater displacement but smaller apparent outside dimensions and quieter operation. Next month we'll give a detailed report.



Look closely at this Evinrude outboard being driven by the company's most experienced test driver, Ralph Evinrude, and you'll see 135. But inside is 200 hp!

## No fish story

Most of us don't rate record books with our catches, so the Newton Line Co. of Homer, N.Y. 13077, has announced an award for "average but proud" fishermen. If you use Newton's new E.S.P. or one of its five other lines and land one you especially like, send a picture of the fish, when and where caught, type and test of their line plus exciting details and they'll send you a "gold" certificate for framing. Who says lunker losers can't win?

## Presidential sports award

The President's Council on Physical Fitness and Sports has lowered the minimum age from 18 to 15 years and opened the way for most high school students to earn the Presidential Sports Award.

Air rifle, rifle and clay-target shooting are included. Qualifying standards for the air rifle award require at least 2500 rounds fired, no more than 50 in any one day, and a minimum target distance of 33 feet. Rifle rounds fired have the same requirements, but at 75 feet minimum for rimfire and 100 yards for center-fire. Trap and skeet awards require 2500 targets over 50 sessions. Shooting must be conducted under safe, regulation conditions.

Qualifying standards and personal log-book supplies may be obtained free by schools and clubs from Presidential Sports Award, Box 129, Radio City Station, New York, N.Y. 10019.

## Medical matters

The virulent Rocky Mountain spotted fever, once a rarity endangering western sheepherders, has been spreading recently with 135 cases re-

ported last year in Virginia, 113 in North Carolina, and Oklahoma and Tennessee ranking third and fourth in the nation. The disease is carried by ticks that can attach to an outdoorsman or his dog—both should be checked before and after any outing. Remove ticks with tweezers, if possible, without touching them or leaving the head imbedded in the skin. Sometimes heat from a match or cigaret will force a tick to release its hold and back out. While most ticks do not transmit the disease, it is wise to treat them with caution.

An outdoorsman with special medical problems can do himself a favor, especially when traveling, for \$7. That buys him a lifetime membership in the nonprofit Medic Alert Foundation International, Box K1, Turlock, Calif. 95380. He then wears the Medic Alert emblem on his wrist or neck—information on the hidden side can warn of conditions like a weak heart, diabetes, epilepsy or allergic reactions to various drugs. A telephone number is given so a collect call can provide immediate information for treatment.

For travelers, it's a small price for a lifesaving service.

## Travel action

Some 9000 miles of trout streams, 2000 stocked lakes and 831 mountains over 11,000 feet high are waiting for outdoorsmen in Colorado. We prefer camping at Maroon Bells of Aspen and in Rocky Mountain National Park near our home town of Fort Collins, but a query to the Tourist Bureau, 986S State Capitol, Denver, Colo., will bring details of rodeos, rock climbs, pack trips and rock-hounding as well.

For a combination exploring/yachting look at cruising, snorkeling and relaxing in the Virgin Islands, there is the Robinson Cruise-O Plan, with more details available from Rockresorts, 30 Rockefeller Plaza, New York, N.Y. And where and how to find great hunting, fishing, exploring and photography sites from Canada to Argentina is described in *Outdoor Adventures*, \$1 from Braniff, Box 35001, Dallas, Tex.

## National Hunting & Fishing Day

The date to remember: Saturday, Sept. 27. ★ ★ ★





# Isn't Black Velvet smooth?

Just the thought of it can give you a good feeling.  
Black Velvet® Canadian Whisky. The smooth Canadian.

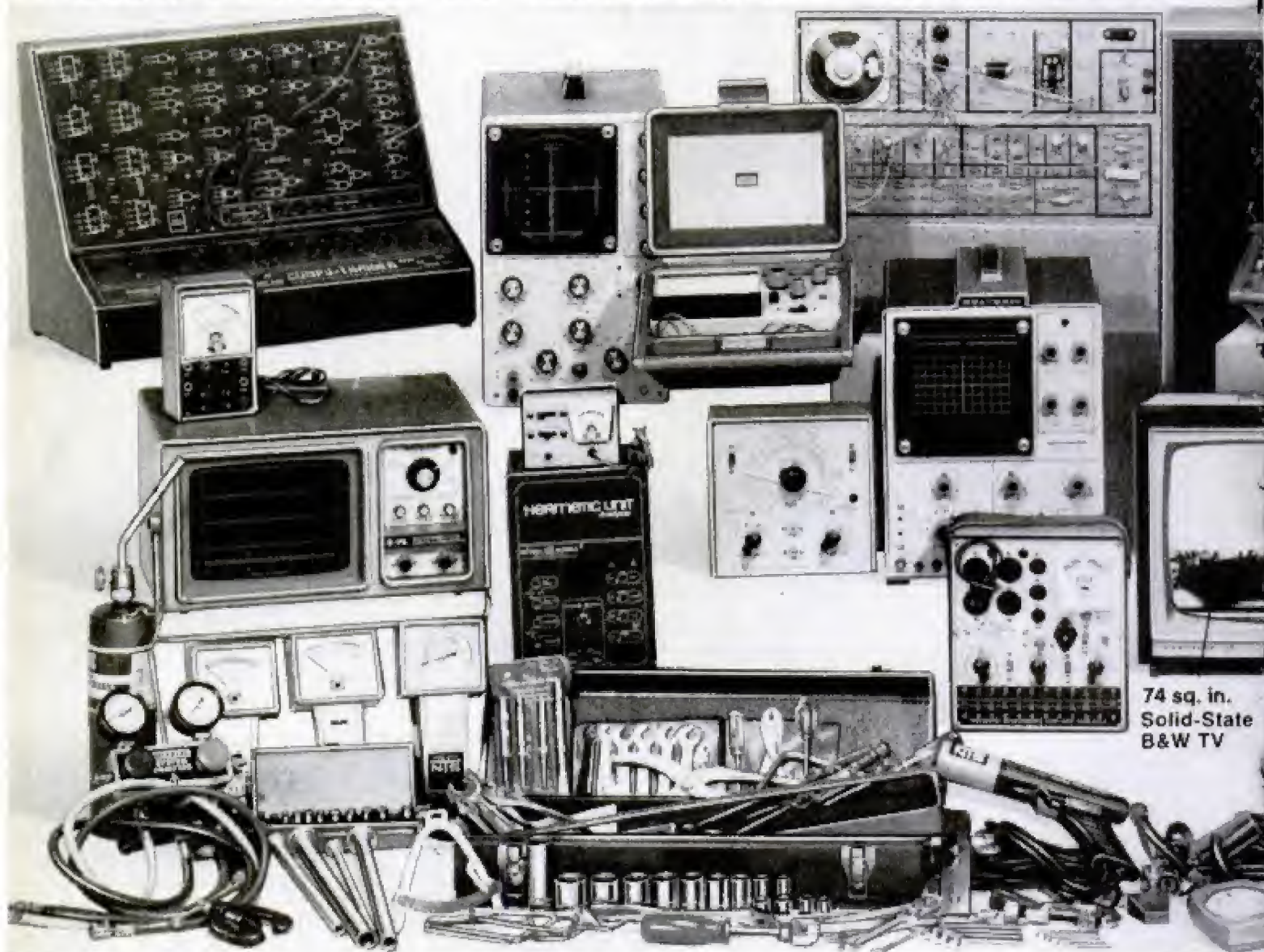
BLACK VELVET® BLENDED CANADIAN WHISKY 80/86 PROOF IMPORTED BY ©1974 HEUBLEIN, INC. HARTFORD, CT 06183

Mixing with water or other beverages is recommended. Drink Responsibly.



# The better the training the better you'll

Send for one of these **FREE** Illustrated



**Build and keep** some of the finest technical equipment made when you train with an NTS Project-Method home study course. And it's usually the same type of equipment you'll meet in the field and use on the job. It will help you acquire first-hand experience and skill — help prepare you better for a variety of exciting technical careers:

**ELECTRONICS DIVISION:** Courses include professional equipment like 5" solid-state oscilloscope, transistor and tube-tester, vector monitor scope, 74 sq. in. B&W TV, and solid-state stereo AM-FM multiplex receiver, speakers. Color TV courses feature advanced NTS/HEATH DIGITAL GR-2000 Color TV with silent varactor diode tuning; digital read-out channel selection (with optional digital clock), big 315 sq. in. screen.

**MECHANICS DIVISION:** Learn engine diagnostics, motor overhaul, transmissions, automotive maintenance. Courses include 9 in. solid-state automotive oscilloscope, testers, tools, mechanic's steel tool box, & more.

**AIR CONDITIONING, REFRIGERATION/HEATING DIVISION:** Learn servicing of commercial, industrial and residential heating and cooling equipment. Courses include hermetic unit analyzer, leak detector, charging testing-purging manifold set, tools and more.

**HOME APPLIANCES DIVISION:** Courses cover repair and maintenance of washers, dryers, ranges, smaller appliances. Equipment includes NTS Circuit-Trainer and professional multimeter.



# and the equipment be equipped.

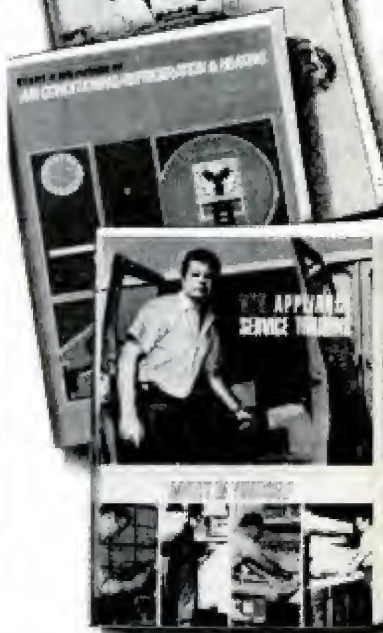
## Career Guides:

COMPARE OUR  
KITS AND LESSONS.  
COMPARE OUR  
TUITION.



NTS guide  
to careers in  
Electronics

NTS Guide  
to your opportunities in the  
Automotive  
Industry



NTS/HEATH  
GR2000  
Digital  
Solid-State  
Color TV  
315 sq. in.  
Picture

12:01:35

(Simulated TV Reception)

**LOWER TUITION FOR YOU:** We employ no salesmen, pay no commissions. You receive all home-study information by mail only. Make your own decision, your own comparisons. Send card today or write for illustrated catalog in field of your choice, all details.

**NO OBLIGATION. NO SALESMAN WILL CALL.**

**APPROVED FOR VETERAN TRAINING**  
Get facts on new 2-year extension.

## NATIONAL TECHNICAL SCHOOLS

TECHNICAL-TRADE TRAINING SINCE 1905  
Resident and Home-Study Schools  
4000 So. Figueroa St., Los Angeles, Calif. 90037

**NATIONAL TECHNICAL SCHOOLS**  
4000 South Figueroa St., Los Angeles, Calif. 90037  
Please send FREE Color Catalog and Sample Lesson.  
NO OBLIGATION. NO SALESMAN WILL CALL.

Dept. 201-085

☐ Electronics Division  
☐ Mechanics Division  
☐ Air Conditioning/Refrigeration/Heating Division  
☐ Home Appliances Division

NAME \_\_\_\_\_ AGE \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_

Please fill in Zip Code for fast service \_\_\_\_\_

☐ Check if interested in G.I. Bill information.  
☐ Check if interested ONLY in classroom training in Los Angeles.





BY MORT SCHULTZ

## CAR CLINIC

### Checking Chevy's 250 squeak

*I own a 1974 Checker sedan that's equipped with a 250-cu.-in. Chevrolet L6 engine. We (the shop chief and I) have diagnosed that a squeak in this engine is coming from the rocker arms. We have replaced the assembly, but the squeak remains. I understand this is a common problem with the Chevy 250. Is there a solution?—Bill Dasheff, New York*

You're right! Hopefully, there's a solution, but at this writing, that fix is new and in an experimental phase. Go to a Chevrolet dealer and order part No. 1051343, a kit containing a cleaning solvent and a product that will serve as a cushion between rockers and balls. The noise is coming from here. Some say it's happening because of insufficient lubrication; others contend it's because of overlubrication. Who cares as long as the fix works.

Remove all the rocker arms and examine balls and arms. Replace scored parts. Now, clean both the old and replacement parts thoroughly with the cleaner packed in the kit, paying special attention to the center of the rocker where the ball makes contact. The parts must be spotless.

Apply the cushioning material to the ball area, rocker arm, and unthreaded portion of the stud. Allow the compound to dry for at least 45 minutes. Then, put everything back together again and keep your fingers crossed, or pray, or stroke your rabbit's foot . . . whatever it takes.

### Paying his dues

*The coolant level of my 1969 Buick LeSabre is supposed to maintain itself 3½ inches below the top of the radiator filler neck, or so the book says. But when I drive 30 miles after filling the radiator, the coolant level drops 7 inches. I have checked all hoses and the radiator, but can find no leak. I admit I haven't drained the radiator in six years.—Ernest Piller, Cincinnati*

You're lucky your cooling system hasn't blown sky high. Whether lack of maintenance has anything to do with your problem is academic. The point is that cooling-system service should be done every two years.

Anyway, you don't state whether the engine is overheating, but I as-

sume it isn't, because you probably would have said so. If the coolant level shows a 7-inch drop below the top of the radiator neck when the engine is cold and there is no overheating, the extra coolant you're installing may not be needed. However, I would still do that cooling-system maintenance.

Suppose there is a coolant loss and overheating condition. You should have the entire cooling system, including the radiator cap, examined with a cooling-system pressure tester to uncover a defective part or leak. Small leaks aren't always detectable by eye—that's the reason for the pressure test. The system is put under the amount of pressure it's under during operation. This permits a minor leak to reveal itself.

This examination should be followed by draining and flushing the radiator and cylinder block. Install fresh coolant. Now, if coolant is being lost out the overflow tube because of excessive pressure being built up inside the system, it might be a good idea to install a radiator overflow bottle and the new radiator cap it requires. This bottle will keep this expensive liquid from being lost.

### Tire mixing dos and don'ts

*While reading the April, 1975, issue of Car Clinic I came across your item Tire Topics in which Elwood Long of Oley, Pa., asked whether steel-belted radials can be used on the same car as cord-belted radials, and if bias-belted tires could be used on the same car with plain bias tires. Your answer was "yes" to both questions. However, there are some exceptions as radial, bias-belted and bias tires are built in different construction series, and there are combinations which cannot be used. I am enclosing a copy of a tire application guide which shows acceptable, preferred, and no-nos in tire mixing. —J. V. Compton, Consumer Relations Director, Cooper Tire Co., Findlay, Ohio*

Thank you for this solid information. I wish I could publish the guide here, but limited space makes that difficult, so I suggest that any reader thinking of mixing different types of tires on his car write for this guide. It may be obtained from

the Rubber Manufacturers Assn., 1901 Pennsylvania Ave. N.W., Washington, D.C. 20006 and is entitled *Tire Application Guide for Passenger Cars*. Other sound data offered includes the proper way to rotate tires and a clear explanation of bias, bias-belted and radial construction.

### Dim, but worrisome

*My 1971 Matador with 304-cu.-in. V8 engine is a great car, but has one problem that is bothering me. No one has been able to tell me why the alternator warning light on the dash stays dimly lit whenever the engine is running. The electrical system has been checked thoroughly. Nothing bad was uncovered, and I was told to forget the glow. But it stares at me like some evil eye, and I won't be satisfied unless you tell me to forget it.—Newton Tripp, Conklin, N. Y.*

Sit tight, and let's go. There are



### Save oil

Why throw away perfectly good engine oil just because your crankcase won't take more and you're left with a partially filled quart can. You can't store this open can because it will become contaminated. The solution is to use a plastic lid from a one-pound can of coffee. It will fit a one-quart can of oil snugly. The oil can then be stored for future use in your engine, or you may want to save it for use in your lawnmower next year.



**“Why Viceroy? Because I’d never  
smoke a boring cigarette.”**



Warning: The Surgeon General Has Determined  
That Cigarette Smoking Is Dangerous to Your Health.

16 mg. "tar," 1.0 mg. nicotine;  
av. per cigarette, FTC Report Apr. '75



Enjoy Viceroy flavor—now in a bold new pack.

**Viceroy. Where excitement is now a taste.**



## CAR CLINIC

(Continued from page 22)

several reasons why that dash light is giving you the evil look. Generally, they are centered at the alternator, or in a harness or connection. Here's the rundown:

1. The most common trouble area is at a place called the diode trio—a protective device for the rectifier diodes.

To determine if the diode trio is causing the glow, run the car about 10 minutes with heater and headlights on. This will cause the diode trio to heat up. After 10 minutes, turn off heater and headlights, and connect a voltmeter between the alternator and diode trio. A reading in excess of 0.3 volts indicates the diode trio is breaking down or there's a poor solder connection at the rectifier diodes.

2. If the alternator checks out okay, test the 4-amp. fuse in the fuse box for a tight connection. If the fuse is okay, hook a jumper wire from the alternator output terminal to the 4-amp. fuse. If this causes the indicator light to go out, the trouble is in the harness from the alternator to the key switch, or from the key switch to the fuse panel.

If the jumper wire doesn't put out the light, the problem is with the yellow wire from the 4-amp. fuse, or a poor pin terminal at the printed circuit.

3. Now, before going through all the above work, give that evil eye your own evil stare. Can you classify it as a "very dim glow"? If you can, then install a GE 168 bulb in place of the No. 158 bulb. This may be all you need.

There are other reasons for the glow, but the three mentioned cover 9 of 10 cases. If they fail to solve the problem, get back to me and I'll outline the other possible causes.

### Pop gun

*I have a 1969 Chevelle with a 307-cu.-in. V8 engine. When I go downhill and remove my foot from the accelerator, I hear a popping coming from the muffler. It is not a loud backfire. Trying to overcome the noise, I installed new sparkplugs, points, condenser and distributor cap, and set the timing exactly. No dice. Do I have a restricted exhaust system?—J. F. Nolan, Seattle.*

I doubt it, because a restricted exhaust would tend to muffle noise coming from the exhaust. I think your

(Please turn to page 27)

PM CAR CARE  
**TIP**



### An oldie, but a goodie

You may not know the plunger trick, so here goes. If your vehicle shows up one day with a shallow, dish-shaped dent, duck downstairs and find the old plumber's helper. Wet it, press it against the dent and pull. The dent might just pop right out. The trick will serve especially well for dents in door panels and similar places where you can't get your hand behind to push out.

## INTRODUCING INSTANT SILENCE: PERMATEX SILICONE LUBRICANT



Open the car door. Hear that squeak? Roll down the windows. There it is again! Try the trunk. Curses! Squeaks, squeaks everywhere. Ear muffs are not the answer. You need the squeak squelcher from Permatex: Silicone Lubricant. Just shoot a quick spray of Permatex Silicone Lubricant on the source of your squeak, and you've got instant silence. Permatex Silicone Lubricant doesn't melt, doesn't gum, doesn't fail in bad weather. It's also great for just making things slide easily and will also protect battery terminals from corrosion.

Permatex Silicone Lubricant. Get a can today—for instant silence.



**Permatex®**

PERMATEX COMPANY, INC.  
P.O. Box 1350, West Palm Beach, Florida 33402  
Telephone 305/686-0880 • Telex 513-417

MADE FOR THE PROFESSIONAL





# Datsun Li'l Hustler. First, it's built to last.

Nowadays, good long-term investments are hard to find. Datsun's Li'l Hustler is one exception. Sure, it's a gas saver. In fact, according to the EPA's 1975 test results, Li'l Hustler gets better mileage (31 mpg<sup>6</sup>) than any other pickup in America, import or domestic. But the real test of an investment is how it holds up in the long run.

**Example 1:** Our '75 Li'l Hustler has a new, more powerful 2000cc overhead cam engine.

**Benefits:** Less internal friction than in a pushrod engine, and about 43% fewer moving parts. More efficient power.

**Example 2:** Our cam is driven

by a twin chain, completely covered and bathed in engine oil.

**Benefits:** Less subject to wear and stretching than semi-exposed belt-drives. Tension adjustment is automatic, too.

**Example 3:** For '75 our axle ratio is an economical 4.37.

**Benefits:** Fewer engine revs per mile, longer engine life and great gas mileage.

**Example 4:** Improved ferrite stainless steel exhaust components and improved muffler construction.

**Benefits:** Extra corrosion protection and reduced back pressure for more efficiency, longer life.

**Example 5:** A nearly indestructible welded lattice frame.

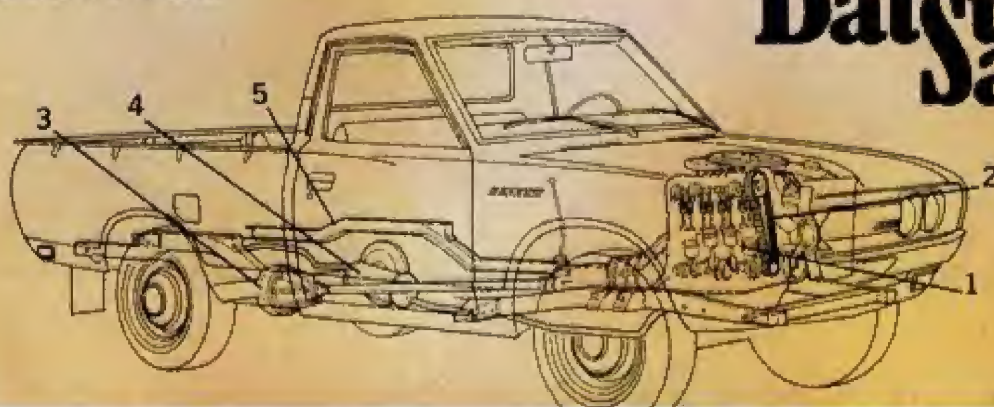
**Benefits:** The strength and support to endure a lifetime of rocks and ruts and grinding bumps.

Add 1400 lbs. of payload and passenger capacity, plus options like factory-approved air and 3-speed automatic transmission, and you've got one investment that just won't quit ... Datsun's Li'l Hustler. Available in two models: Standard 6-ft. load bed or the new 7-ft. Li'l Hustler Stretch.

**America's #1 Selling Small Pickup**

(<sup>6</sup>1975 EPA highway test results, all states except California.)

## Datsun Saves





# PROBLEM



# SOLUTION

A dirty carburetor is a pretty sticky problem. But there is a solution: STP Carburetor Spray Cleaner.

Very simply, here's how it works. A spray can with a handy nozzle helps you get into the tight spots, the throttle plate, choke, linkage and PCV valve.

The spray itself



has two powerful cleaning agents that blast away sludge, varnish and gum. Those filthy deposits your car is better off without. And STP Spray Cleaner has a surface detergent to keep those deposits from building up again.

Try STP Carburetor Spray Cleaner. See how beautiful a carburetor can be.





## CAR CLINIC

(Continued from page 24)

problem is caused by something we've discussed several times before—the AIR system. Give it a thorough inspection, seeing that vacuum hoses are in good shape and connected tightly and properly. AIR components—valves, pump and other plumbing—have to be top drawer, and engine idle speed setting must be set right to specification. Once the AIR system and carburetor are squared away, there should be no more shootin'.

### Steering-gear grunt

*For some time my 1973 Cougar power-steering system has been emitting a noise I can only describe as a grunt or groan. Is there a solution?*  
—Louis Harrow, Manchester, N.H.

Here comes GM to the rescue with GM power-steering fluid, which you have to buy from a GM source. Flush and refill the system—you'll need two gallons of fluid. If this fails to get rid of the groans, install a new spool valve actuator assembly (part No. D1ZZ-3812-B). When the new valve actuator has been installed, fill the system with GM fluid.

This noise can also strike 1971 and 1972 Cougars, some 1974 Montegos,

1971-73 Mustangs and some 1974 Torinos. All are equipped with Saginaw power-steering gears, and Saginaw happens to be a GM division.

### Going screwy

*I own a 1966 Plymouth 'Cuda which has the automatic shift on the floor. The entire shift console has come loose. The shifting lever is tight and works fine, but the vibrating console is driving me nuts. Can I tighten it?*  
—Mike Courtney, Mobile.

Easy does it, Mike. You will find the screws in the console glove box. Just tighten them. If stripped, replace them with oversize screws.

### CC rider

*What happens if I run low on gas with my 1975 Cadillac equipped with catalytic converter? And what happens if I'm in a burg where service stations don't sell unleaded gas?*  
—Fred Wolff, Natchez, Miss.

You pour as little leaded gas as you need into your fuel tank and hope you can reach some other burg (like the size of Pittsburgh) where stations stock unleaded gas. Use of leaded fuel will decrease the effectiveness of the catalyst, but a little won't hurt. Contrary to what some

believe, leaded gas won't plug the converter, harm or restrict the exhaust system, kill the engine or cause wars. It will simply, in time, destroy the catalyst and cause any service station found putting leaded gas into a catalytic-converter-equipped car to be heavily fined—if caught.

## SERVICE TIPS

■ **Don't be fooled** into an expensive replacement of a part of your Chevy High Energy Ignition system because of a loose coil. Chevrolet tells us that some servicemen are replacing HEI coils on L4 and L6 engines because the parts seem loose in their cores. This is the way it's supposed to be, because there's a built-in clearance between coil and coil housing. If the coil tests good, keep it—loose or not.

■ **Are you getting a squeal** from up front on your new Dodge Colt with air conditioner? I bet someone forgot to tighten the compressor drive belt at the 600 mile service. The belt should be torqued to 100 to 110 ft.-lb., using a belt tension gauge. ★ ★ ★

### GOT A PROBLEM WITH YOUR CAR?

Just ask Mort about it. Send your question to the Car Clinic, Popular Mechanics, 224 West 57th St., New York, N.Y. 10019. While letters cannot be answered individually, problems that are of general interest will be published in the column.

# IT'S LIKE GETTING EVERY FIFTH TANKFUL OF GAS FREE!



Install an MBI Catalyst and a unique engineering principle goes to work for you . . . it actually **ELECTRO-CHARGES** your gas so you can get up to 22% more mileage from every gallon when installed as instructed.

You should know two facts from the start. One, the MBI Pre-combustion Catalyst is not a mechanical gimmick or gadget. It is a scientific device based on an exclusive design protected by a U.S. Patent.

Secondly, you should know its remarkable mileage economy has been proved by exhaustive, independent tests. Leaded gasoline is required. And normally, full economy is realized only after a break-in period of 1000 to 1500 miles following installation. Effectiveness reports from Scott Laboratory, national magazines, fleet and municipal users are available.

### HOW THE CATALYST WORKS

What makes the MBI Catalyst so effective is its unique electro-chemical charging action.

You install the device between the carburetor and the intake manifold. It is a specially molded gasket incorporating two separate cone-shaped screens—one of cadmium fitting within another of nickel, with air space between.

As gasoline is injected, the dual screens give each drop a positive electrical charge, drawing it instantly to the negatively charged walls of the manifold.

On contact, manifold heat completely vaporizes the fuel so it enters all cylinders much more evenly than before.

### HOW YOU BENEFIT

You get a totally clean burn. There are no rich or lean cylinders. Carbon build-up is prevented. Your gasoline burns with maximum efficiency. Hesitation, pre-ignition and dieseling are usually eliminated.

Your engine operates with smooth, even power all the time. So efficiently in fact that if your car now requires high octane gas, you can probably switch to regular leaded gasoline without knocking or pinging.\*

Regular or premium, you can get up to 22% better mileage when the MBI Catalyst is properly installed, according to simple instructions in the package. That's like getting every fifth tankful FREE. Mail the coupon and start saving.

## YES, I'D LIKE TO GET EVERY FIFTH TANKFUL FREE.

Send me prepaid the proper model MBI Catalyst for my car.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

Car make \_\_\_\_\_

Model \_\_\_\_\_

Year \_\_\_\_\_

Engine size  
(cu. inches)

Carburetor make &  
number of barrels

1-Barrel Models	\$23.15
2-Barrel Models	\$23.95
4-Barrel Models	\$24.75

Mail with check or money order to:

**MBI** Mo-Bile Industries, Inc.

244 NORTH RANDOLPHVILLE RD.  
PISCATAWAY, N.J. 08854

\*Note: The MBI Catalyst is not yet available for 1975 cars, which require unleaded gas.



# Doing anything interesting after work?

If you're spending more time at home these days, why not use some of it constructively? Send for details about this fascinating learn-at-home program from Bell & Howell Schools. Find out how interesting it can be to build new occupational skills in electronics—  
at home, after work.

**Look into it. Mail the card now.**





## Let Bell & Howell Schools help you discover electronics at home.

These days, it seems like almost everything is "going electronic." If you've got time after work, spend some of it learning electronics.

Mail the card for details about this fascinating learn-at-home program from Bell & Howell Schools.

### Why this program is designed to make learning electronics especially interesting.

Electronics is a fascinating subject! But, let's face it, learning at home means you're on your own a good part of the time. There's no teacher to prod and coax you.

That's why we planned this learn-at-home program to hold your attention and make each principle you learn more vivid... easier to remember!

We'd like to think you'll rush home from work each evening— anxious to haul out your course materials and get down to business!

Let's talk about what we do to keep you interested.

### For one thing, we don't just send you books.

Oh, books are important. In fact, this program includes a complete set of carefully prepared texts. And there's no way you can get along without them.

But if you decide to spend some of your time learning electronics at home, you're going to get a lot more than books. You're going to take your jacket off, roll up your sleeves and actually get your hands on modern electronic equipment. You're going to explore it... experiment with it... put it together yourself!

If that doesn't *already* sound like something pretty interesting to do after a day at work, take a closer look.

### With the very first lesson, you get a Lab Starter Kit to help you grasp the basics.

If you're a complete beginner at electronics, this Kit will help you make a good start.

It's not complicated. Just a simple voltmeter and "breadboard" you use for basic experiments that help you understand the fundamentals. Now, you're ready to move on to something more advanced.

(By the way, if you're *not* a beginner, we'll arrange advanced standing in the program so you start at the point that's right for you.)

## You actually build your own Electro Lab® electronics training system.

One evening, when you get home from work, you'll find a large package waiting for you. When you open it, you'll find a set of electronic components.

Probably that same evening, you'll want



to start working with these components. Following the instruction manuals and course materials—and using the principles you've learned—you'll actually begin to build three modern test instruments. Once assembled, they make up a complete home electronics laboratory you'll use for testing, troubleshooting and circuit analyzing.

**Use the design console...** to set up and examine circuits. It's completely modular...no soldering!

**Use the digital multimeter...** to measure voltage, current and resistance. Read data in big, clear numbers—just like on a digital clock!

**Use the solid-state "triggered sweep" oscilloscope...** to analyze modern, "state-of-the-art" integrated circuits. Triggered sweep feature locks in signals for easier observation!

By now, you've spent many fascinating evenings at home learning electronics. And you're really making progress. In fact, you're ready to get into "state-of-the-art" integrated circuitry—even some applications of *digital* circuitry!

### At this point, you start building a remarkable color TV.

As you build this 25" diagonal color TV, you investigate the digital circuitry that allows the automatic channel selector to go directly to preselected channels—as well as discovering the circuitry behind channel numbers and a digital clock that appear on the screen. You find out why the Black Matrix picture tube makes for such exceptional color clarity. You explore "state-of-the-art" integrated circuitry and

the 100 percent solid-state chassis.

Once you've built this TV, you've rounded out your electronic training and gained new occupational skills.

## Bell & Howell Schools' step-by-step methods smooth your progress.

Since you're learning at home, on your own, we do everything possible to keep your progress trouble-free.

For example, since it's easier to grasp new ideas one at a time, we send you texts that break the subject of electronics into small segments. You can take your time to master each one before moving on to the next.

### Special learning opportunities give you extra help and attention.

In case you do run into a problem or two, we're ready to give you more help and personal

attention than you'd expect from most learn-at-home programs.

For example, many home study schools ask you to mail in your questions. Bell & Howell Schools gives you a toll-free number to call for answers you need right away.

Few home study schools offer personal contact with instructors. Bell & Howell Schools organizes "help sessions" in 50 major cities at various times during the year—where you can discuss problems with fellow students and instructors in person.

### The skills you develop could lead you in exciting new directions.

No school can promise you a job or income opportunity. But the skills you learn from this Bell & Howell Schools' program could help you for a job in the electronics industry...or upgrade your present job...or use these skills as a base for continuing your education in electronics programs.

Taken for vocational purposes, this program is approved by the state approval agency for Veterans' Benefits.

### Send for details today.

Why not find out how constructive and interesting it can be to spend time learning electronics. Mail the card now.

### For more details, mail the postage-paid card today!

"Electro-Lab®" is a registered trademark of the Bell & Howell Company.  
Simulated TV test pattern.

If card has been removed, write:


An Electronics Home Study School  
DeVRY INSTITUTE OF TECHNOLOGY



**BELL & HOWELL SCHOOLS**

4141 Belmont, Chicago, Illinois 60641





Because hot taste comes  
in more than one size,  
extra coolness comes  
in more than one size.  
Come all the way up to KOOL.



Warning: The Surgeon General Has Determined  
That Cigarette Smoking Is Dangerous to Your Health.

Kings, 16 mg. "tar," 1.2 mg. nicotine; Longs, 17 mg. "tar," 1.2 mg. nicotine, av. per cigarette, FTC Report Apr. '75





# HOMEOWNERS' CLINIC

## Spotted faucet

*I have hard water (no softener) and I've tried just about everything to clean the spotting off my new chrome-plated kitchen-sink faucet. Those horrid spots defy all my efforts and cleaners! Please, will you suggest something I can use without wearing myself out?—Mrs. Charles Wilson, Ottawa, Ill.*

Must be you haven't tried cider vinegar. It takes some rub-a-dub with a soft cloth, as do most cleaners, but usually clears off the spots with minimum effort. Rinse off the vinegar residue after each cleaning with a soft cloth and wipe dry.

This is not a preventive; the spotting will come back. But if you wipe the plated parts dry after each use it will lengthen the time between periodic cleanings with the vinegar. Use it full strength, by the way.

## Chalking paint

*My older home needs painting. The present paint still seems to be in fairly good condition, but is beginning to fail. I'm thinking of using the new latex paint, but am told it should never be applied over old oil paints. What do you say?—M. Arnold, Erie, Pa.*

I would consider the condition of the old surface in determining what paint to use. Nearly all older paints tend to "chalk" after years of service; the vehicle (oil) has oxidized and the pigment comes to the surface as a powder. If you draw your fingers over the surface, they will probably be coated with this pigment.

Where chalking exists, I think you would be wise to use oil-base paint for the new coating. However, you can get a sealer for use as a base coat over old oil paint before applying latex paint.

## Recoloring streaked wood

*I'm refinishing a table of cherry wood. A narrow, yellowish streak has turned up in the top. I've tried coloring it to match the reddish-colored wood with stains, but without satisfaction. Can you suggest a stain that will color the light wood to match?—Robert Woodson, Marietta, Ohio.*

For coloring sapwood to match a darker heartwood, I've found artist's colors (oils) invariably produce ex-

cellent results. Often two or more colors must be combined to get the right shade, with colors applied direct from the tube with a fingertip and a darker or lighter color added as you go. A drop or two of turpentine makes the colors spread and blend more uniformly. It's a rub-in-and-rub-off procedure until the light and dark areas of wood match. Allow the applied color to dry for at least a week before you apply any final finishing material.

## 'Mold' on plaster

*What will remove what looks like mold from plastered walls? What paint should I use to refinish the walls?—Robert Woolsey, Salem, Ore.*

I assume that the "mold" you refer to is mildew. Most any household cleanser in a strong solution will remove it. My preference is for trisodium phosphate, applied with a scrubbing brush. Be sure to wear rubber gloves and protect your eyes from spatters. But removal is only temporary unless you correct the conditions that produce the mildew. Usually it results from a lack of ventilation and excess moisture in room air. A ventilating fan installed in the kitchen or bath, or one in each, operated after meal preparation or bathing will help prevent new mildew. The wall can then be repainted with any interior wall coating, such as water-based paint.

## Repairing sewing cabinet

*I have what used to be called a Martha Washington sewing cabinet, with half-octagonal end storage pockets. Several pieces of veneer have come off the flats. How can I glue them back? There seems no way to apply clamps.—George Tilman, Madison, Wis.*

You won't need clamps if you use contact cement. Scrape off all old glue to the bare wood on the areas originally joined, on both the veneer and the panel to which it is fitted. Then coat both surfaces uniformly with the cement, spreading it to the edges, but be careful not to get any on finished surfaces it can damage. Allow it to dry as package instructions require, then locate veneer exactly as it was. Press the veneer into full contact and go over it with a

roller or wood block and hammer to assure good adhesion to the surface. By the way, there are now nonflammable contact cements on the market; you might look for one of these to use.

## Mix wood and oil?

*I recently installed a wood-burning stove in my basement venting into the same flue as my oil burner. I'm told such venting is dangerous. Is this so, and will a stove vented this way affect draft control of my oil burner?—Joseph Filtz, Bangor, Me.*

I hesitate to recommend this installation, because of potential hazard and reduced efficiency of both units. There is the perhaps remote possibility of inducing "blow-back" in the oil furnace owing to draft interference, and reduced efficiency of either unit or both will cost you fuel money. I think you would be wise to plan a means of venting the stove with its own flue.

A separate prefabricated chimney might serve the purpose.

## Warping mantel

*The mantel over my fireplace is an unfinished walnut plank, 3 in. x 7 in. x 10 ft., and it tends to warp, the center rising about 1/2 in. If we turn it over it levels temporarily, but warps again in time. What can correct this? Will finishing prevent warping? What finish?—Kenneth Hafner, Fowler, Mich.*

You don't say how long the mantel has been installed, but insufficient air drying is a likely cause. Planks of this size usually stabilize when thoroughly dried to a low moisture content. Before taking any corrective action, such as planing the surface, I suggest you give the plank a little more time, as it might level of its own accord. Then it might be smoothed and given a clear finish such as used on bar tops. ★★★

*Do you have a home maintenance or repair problem? Send it to Homeowners Clinic, Popular Mechanics, 224 West 57th St., New York, N.Y. 10019. Letters cannot be answered individually, but problems of wide interest will be discussed in this column. For more home repair and maintenance help, get PM's Home Care Guide, \$4.49 postpaid. Send orders to PM, Dept. HHS, Box 1014, New York, N.Y. 10019.*



# SCIENCE WORLDWIDE



## Airliners 'gasp' for air

GASP is the catchy acronym for Global Air Sampling Program, a new NASA study designed to determine worldwide levels of air pollution. Pan American World Airways was chosen to collect samples in various parts of the world. A number of its 747s have had a special scoop installed (arrow) that automatically opens at 20,000 feet to gulp in samples of air. The air flows through a tube (middle photo above) to a device that filters out impurities. A computer and associated gear (directly above) control the sampling apparatus and record navigational data.

Air over the United States is collected by similarly equipped United Airlines 747s. NASA says that the GASP study, which is expected to last for at least 5 years and possibly for 10 years, will serve to establish the levels of various contaminants in the atmosphere and determine pollution trends.

## New way of treating coal

A problem in converting most American-mined coals into gas is that they swell and cake when burned, clogging fixed-bed gasifiers. To get around this, General Electric researchers grind coal into a fine dust, which they mix with ashes and other substances. The mixture is then extruded directly into a pressurized gasifier in the form of evenly sized pellets, like those shown in the photo below. The method will be tested in a Schenectady, N.Y., pilot plant capable of converting a ton of coal per hour into 100,000 cubic feet of gas. The gas will be used to generate electricity.



## Jojoba bush holds promise

If the potentials of the jojoba bush can be realized, there will be an immediate benefit to the Indians of the Sonoran Desert in California and to the world's whale population. Beans from the bush, which grows wild in

the desert, contain an easily extractable oil with properties almost identical to the oil of the sperm whale, an endangered species, according to a report by the National Research Council.

Jojoba oil has potential use as a lubricant for automatic transmissions, high-grade machinery and precision instruments, and in the manufacture of industrial products. Up until 1970, when the importation of sperm whale products was banned by the United States, sperm oil was used for automatic transmissions. No satisfactory substitute has been found. The successful cultivation of the jojoba bush in the Sonoran Desert could give an economic boost to the impoverished Indians of that area.



## Carbon keeps cool under fire

When it lands (at about 140 mph) the Air Force's new 21,500-pound F-16 fighter will be brought to a stop by carbon-composite brakes that weigh less than the brakes on many cars. To demonstrate the brake's tolerance for high temperatures, technicians recently applied a 3000° acetylene flame to a carbon brake disc and a steel aircraft disc of the same relative size. The steel disc burned and melted, as the photo shows, but the carbon disc showed little effect.

Another advantage is that the carbon-composite is 50 percent lighter than its steel cousin, according to Goodyear, manufacturer of the improved brake. ★ ★ ★



# Remodeling with GAF doesn't have to have you climbing the walls or going through the roof.

## HOMEOWNER'S GUIDE TO SUCCESSFUL REMODELING WITH TIPS ON ROOFING & SIDING



by A. M. Watkins  
author of The Complete  
Book of Home Remodeling,  
Improvement, and Repair

### CONTENTS

Remodel or move?  
How to increase the value of yr.  
Twelve fundamental tips  
What makes a good plan?  
How to finance  
Adding living space  
Conserving energy



Please rush me your free booklet  
of objective remodeling informa-  
tion, compiled by a well-known  
authority.



NAME \_\_\_\_\_

ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_

STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Send literature ☐ on GAF roofing  
☐ on GAF siding

PM85

GAF CORPORATION, GAF Building Products,  
140 West 51 Street, New York, New York 10020





## Build the Mini-Indy racer

Capable of up to 40 mph, this flashy little speedster offers fun and thrills for all ages. You can build it from easy-to-follow plans.

**D**riving this wild little racer is a real thrill, and would you believe 90 mpg on the way to the finish line? Powered by a lawnmower engine, it's hot enough to hit a top speed of 40 mph to give racing buffs, young and old, a mini-sensation of the Indianapolis 500.

No welding is involved in building the Mini-Indy. All parts are off-the-shelf items available at lumberyards, hardware stores, bike and kart shops. Wheels are standard kart rims fitted with air flotation tires. The engine is a horizontal-shaft, 5-hp. Briggs & Stratton. Most of the steering and suspension system comprises threaded iron-pipe fittings. You steer by the handlebars and work brake and throttle with hand-grip controls. ★ ★ ★

### HOW TO ORDER PLANS

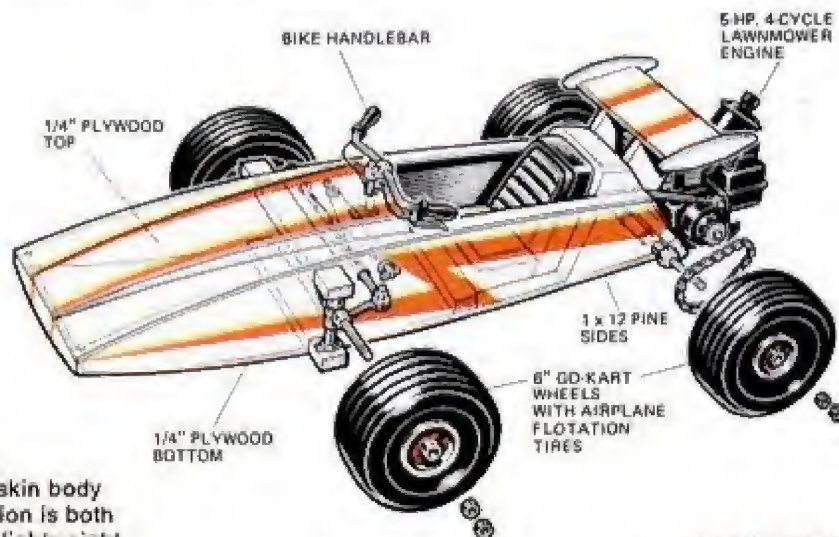
To order plans, instructions and materials list for building the Mini-Indy, send \$5 (check or money order) to PM's Indy Racer, Stevenson Projects & Publications, Box 564, Del Mar, Calif. 92014. Make checks payable to Stevenson Projects & Publications, and allow three weeks for delivery.



Small enough to fit into station wagon, light enough (130 pounds) for two men to lift, Mini-Indy is easily carted to parking lot or track.



Lawnmower engine is bolted to solid cantilevered platform that extends back from the bottom of the body.



All wood, stressed-skin body construction is both rigid and lightweight.

Art: Peter Trojan





## Over 3,000,000 Continental Insurance policies sold last year.

What's the reason people bought so many Continental policies?

*In some cases, it's low price.*

Today, insurance companies don't all charge the same rates. In fact, several recently published surveys show rates vary widely. So now, more than ever, it pays to shop and compare.

*In some cases, it's better coverage.*

Take our unique PCP Plan, the all-in-one plan. It lets you combine separate policies on your home, your car, and yourself all into one neat little package that actually gives you more insurance coverage for your insurance dollar.

*In some cases, it's quality service.*

With a Continental policy, you get 24-hour toll-free Dial-A-Claim Service—backed by over 1600 claims adjusters located throughout the United States and Canada.

*In some cases, it's our product line.*

We sell more kinds of personal

and business insurance than most other insurance companies.

*In some cases, it's the idea behind The Insurance Store.*

Each Store is owned by an independent agent. Unlike agents who represent Allstate or State Farm only, independent agents offer you a variety of companies, including Continental. So under one roof, you can do all your shopping. Then select. Not merely settle.

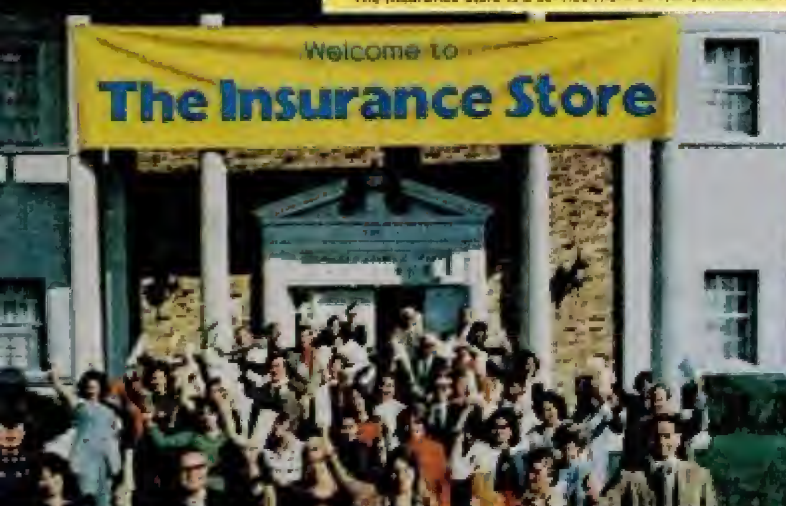
*In some cases, it's all of the above.*

If any or all of them interest you, visit your nearest Insurance Store. To find it, just check the Agent listing under Continental Insurance in the Yellow Pages.



**Continental Insurance**  
featured at  
**The Insurance Store**

The Insurance Store is a service mark of The Continental Insurance Company.





# The proud smoke.

Today's L&M...Rich, mellow, distinctively smooth.  
Blended for today's taste with a tradition of over  
100 years of tobacco experience.  
It's a matter of pride.  
Proud tradition. Proud heritage. Proud taste.



Warning: The Surgeon General Has Determined  
That Cigarette Smoking Is Dangerous to Your Health.

© LIGGETT & MYERS INCORPORATED, 1976

Filter (Box): 17 mg. "tar", 1.1 mg. nicotine av. per cigarette, by FTC Method.





## How to stay alive in a small car

**Don't trust traffic lights totally. Be aware of light-shooters who could demolish you.**

by Bill Hartford

AUTO EDITOR

Illustrations: Roy Grinnell

Even the obituary didn't settle the score: "... Mr. Hartford was killed when his small station wagon was hit from the side at the intersection of ..." No mention that I was crossing under a green traffic light! No mention that the other driver ran the red! No mention that I was wearing a lap and shoulder belt! Even though belts wouldn't have helped in this side-impact situation (nor would have an air bag), I won't leave the driveway without belting up.

The beginning of the end for me (almost) began when the traffic light turned green. As shown above, I was part way into the intersection crossing a six-lane highway. Cars in the two right-hand lanes were stopped. I glanced left again: A car was coming up to the light in the third lane, but it was a blur! The driver wasn't even on the brakes! I stopped with a squeal.

The huge car flashed by my front bumper without even slowing down. My heart sped up and didn't stop pounding for minutes.

Was I lucky? I prefer not to think of it that way. I would hope that my

life means more to me than to trust it to luck, to other drivers or to any traffic-control device.

Staying alive in a small car on roads heavy with cars twice your weight, and trucks whose wheel hubs are at your eye level, takes more than luck. If you drive a small car you must have, or develop, an attitude toward driving, and driving skills that will keep you from being involved in an accident in the first place.

While good driving habits are important in any car, they are especially essential for drivers of compacts and subcompacts. Many small cars lack the power and acceleration of their bigger brothers—the quick burst of speed that can get you out of a hazardous situation in a hurry. Their light weight tends to make them more wind-sensitive and their lower profile makes them harder to see. Drivers of small cars must take special precautions to avoid getting into scrapes. Here, such drivers often have an advantage because of the superior evasive capability of small cars.

Don't tangle with anything else

on the road—or along the road. Trees don't budge and neither do such marvelous, man-made tombstones designed into highways as concrete supports and nonbreakaway utility poles. And it doesn't take much knowledge of physics to appreciate that in an accident involving a small car and a big car, the driver of the small car is going to come off on the short end of the stick. A small car and a truck we won't even talk about!

The statistics are numbing. Last year more than 46,000 people died in traffic accidents. While this represents a decline from the previous year (attributed mainly to lowered national speed limits and less driving), the trend is back up again this year. One factor cited is increased use of smaller cars.

Just as alarming are the factors in highway safety over which you have little or no control. You can't eliminate the safety hazards that exist on the highways you drive; you can't govern the unpredictable actions of other drivers, and so on.

That leaves just you—and your car. Assuming you keep both in good working order and fit to be on the



## How to stay alive in a small car

road, you've got only that one thing to keep you alive: your skill behind the wheel.

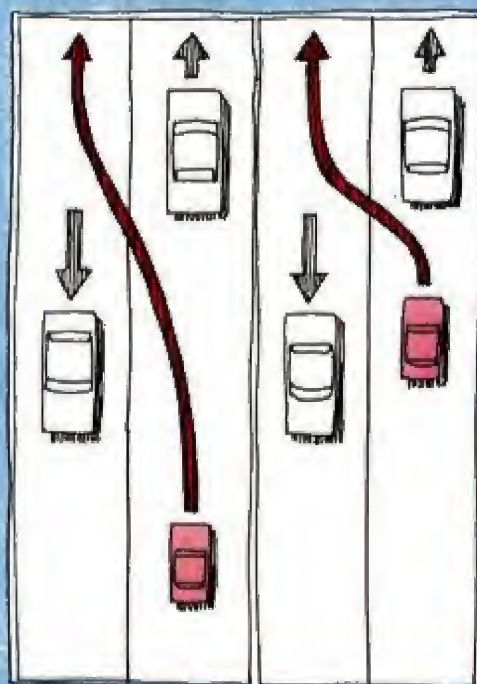
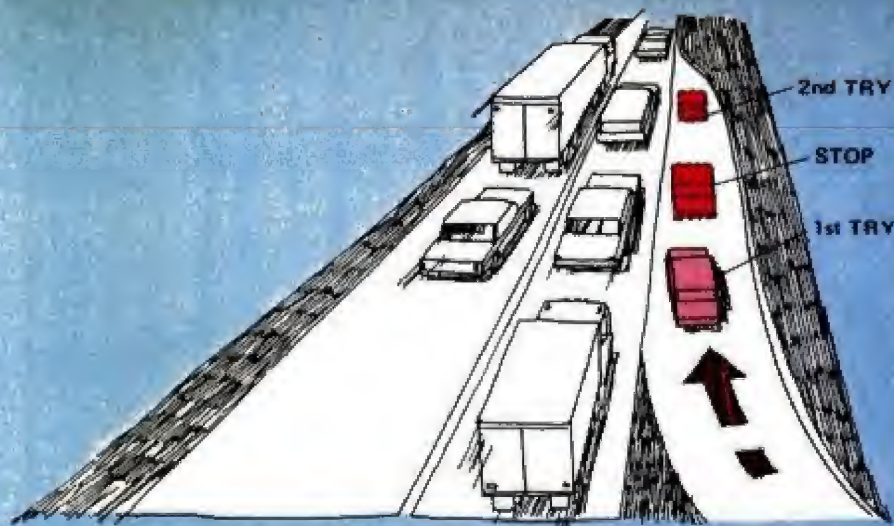
The incentive to develop that skill can only come from you: Driver license examinations test you for only the most basic knowledge of driving, and few driver-training programs have the resources to teach you how to cope with situations that will most seriously threaten you when you get into real-life—or death—driving emergencies. Skidding and skid control, for example, is almost always explained, but the classroom is a long way from personal instruction in a test car on a skid pan.

The technique of controlling skids and other advanced driving skills can only be learned by doing. (For advanced driving courses or schools, check the driver-education instructors at your local school.) Even specific lifesaving tips and driving techniques shown on these pages and page 106 must be practiced over and over to become part of your regular behavior at the wheel.

All actions at the wheel, whether those shown here, specifically, or others that contributed to your safety, reflect your judgment and ability to anticipate. Of course, acting on your judgment can be done only when you are concentrating on your driving.

So, ultimately, it is your judgment, concentration and ability to "read the

*(Please turn to page 106)*

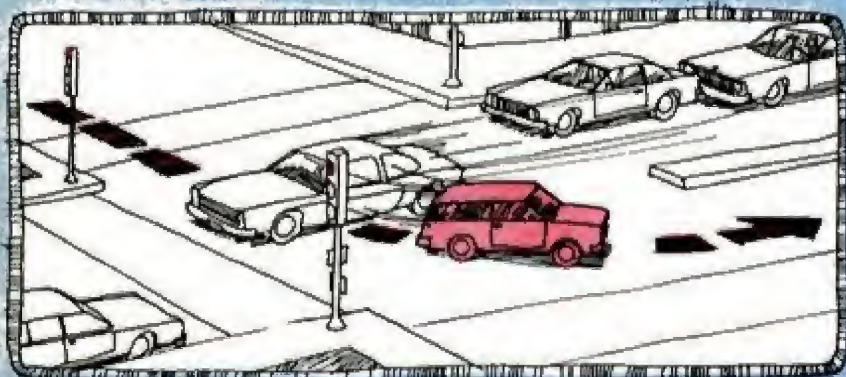


RIGHT

WRONG

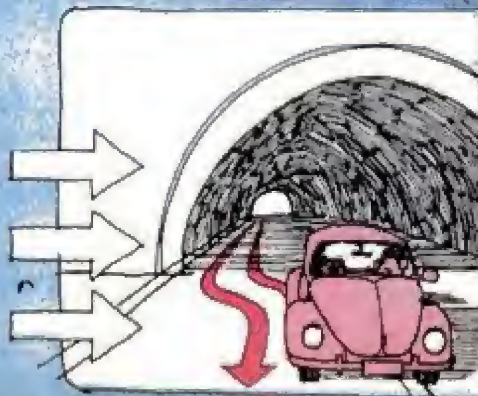
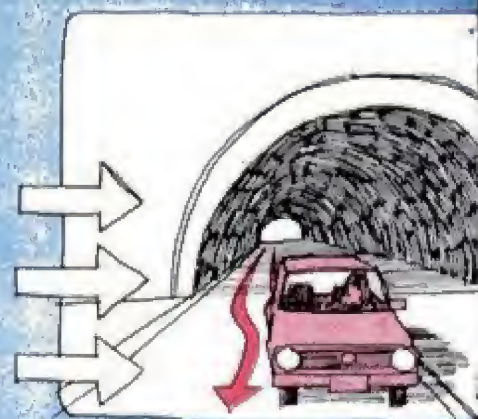
### Sharpen your timing

Take pride in driving smoothly and with rhythm. Any car, no matter how small or how low the horsepower, now can overtake, pass and enter high-speed parkways safely if the driver has a developed sense of timing. On entrance ramps (above) you should gauge speed of the other vehicles, accelerate in proper gear, determine the opening you can take safely and turn on your left directional signal. If traffic is so thick you must stop, do so before you reach the end of the ramp; leave room for a second try. On overtaking and passing (left) do not pull up close behind the vehicle: It blocks your vision, forcing you to make an abrupt, gas-wasting effort to pass. Lay well back from the car you wish to pass, and accelerate so that your speed approaches passing speed as your opening appears. It's the safe, quick, smooth way around. Anticipate the buffeting you'll get when passing trucks and buses, and, if it's raining, set your wipers at high-speed before passing to handle the heavy spray you'll run into.



### Know when to hit the gas

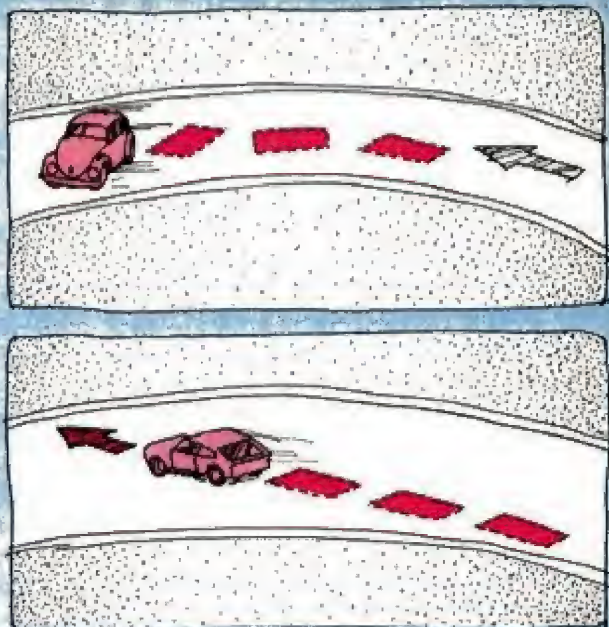
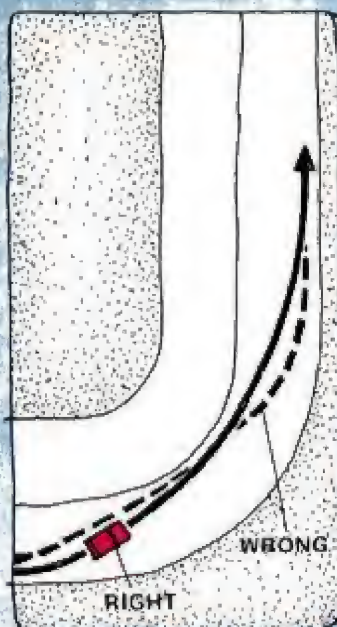
Be just as ready to hit the gas as you are to hit the brakes. Your split-second judgment and reaction time must encompass all of your car's controls and not just the brakes. Here, the driver of the small car (who started across the intersection from a stop when the light turned green) was already in the path of the car running the light when he saw it. Only getting on the gas fast enough prevented a serious broadside accident. This is an actual situation I found myself in not too long ago. It affirmed two other rules for safe driving—especially for drivers of small cars, most of which have standard, manual transmissions: Don't shift gears while in an intersection and be in the right gear for forward speed at all times. If I had been between gears or had just gone into second, I would not have the torque available as I did when I put my foot to the floor in first gear. As more small cars become available with five-speed transmissions, it's especially important to know the shift pattern instinctively and to know the torque and power characteristics of your drive train.





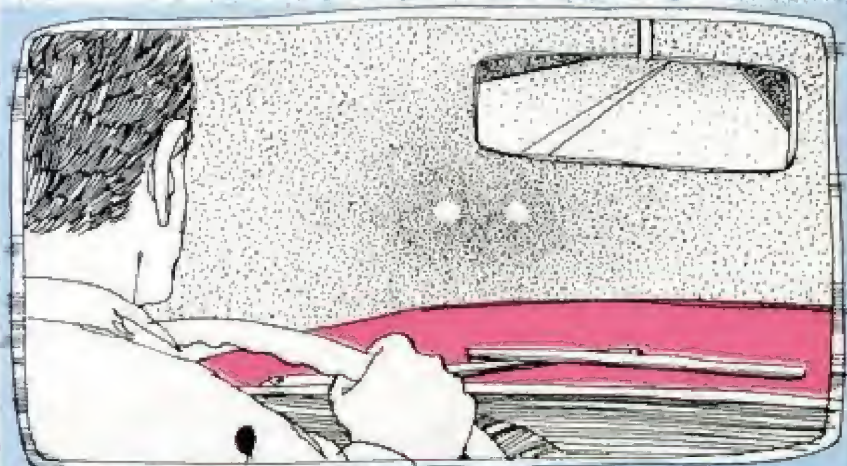
## Keep your balance

When you read that a driver "lost control of his vehicle," you get only part of the story. What happened was that the driver, through improper use of his controls, unbalanced his car and could not regain balance. Total control over the dynamics affecting a moving car is one joy of driving. At right are shown the right and wrong paths through a bend. After braking while the car is still going straight (do not brake in the bend) start on the right side to improve visibility around the bend. Move toward the centerline to straighten the angle of the curve and minimize centrifugal force. At far right, top, is a rear-wheel skid caused by braking while in the turn or by excessive speed. To correct, turn the steering wheel into the skid (direction rear wheels are traveling). At far right, bottom, is a front-wheel skid, usually caused by excessive speed. To recover, get off the gas and straighten front wheels to reduce centrifugal force. Braking and accelerating cause weight shifts affecting balance. When loading your car, distribute weight evenly.



## Let 'em pass

We've all been tailgaters at one time or another—probably out of impatience with a slow driver ahead. On a multilane road, the slow driver is often in the left or high-speed lane. It's law that all drivers keep right except when passing. If this basic rule of lane discipline were followed—and enforced—there would be a safer, smoother flow of traffic. Obviously, on a wide road there's a way around this type of unsafe and inconsiderate lawbreaker—if he doesn't move over after you turn on your headlights and flash your highbeams. On a narrow, winding road, however, there's only one lane, and if you're the one driving slowly, or even at a moderate speed (as you're entitled to do), you'll block drivers behind who wish to maintain a somewhat faster clip. Let 'em by! There's nothing to be gained and danger has a way of spreading: You could be involved in an overtaking and passing accident. So don't blithely watch the chain of cars behind you getting longer while tempers get shorter. When there's a break in oncoming traffic, ease over to the right side of the lane or even onto the shoulder if it's paved, and wave on the driver behind. Put on your emergency flashers if you intend to slow drastically or even stop completely to let by a chain of cars. You'll get rid of the aggressive tailgaters and will be able to resume a safe, leisurely pace, and you'll be sure to get a wave of thanks from considerate, but faster, drivers who, like yourself, have a sense of sharing the road with others and are aware of good road etiquette.



## Know your car

Different cars have different handling characteristics. In strong crosswinds, small rear-engine cars like that shown at the left, below, are easily deflected from their paths, especially when they encounter a sudden gust situation. Front-engine, front-wheel-drive cars, on the other hand, like that shown at the left, top, track very well, even in strong crosswinds. Know your car and anticipate road and weather conditions that would affect its handling. The driver of the rear-engine car who is forced over the road's centerline, as shown here, could be involved in a head-on collision that would jeopardize the life of the other driver as well. If you're the other driver, however, you could take evasive action and be hard against the curb side of the road before the rear-engine car was deflected into your path. So, know your own car, and know about the other cars on the road!

## Be seen and heard

Use your headlights to light up your car for other drivers. Under conditions of limited visibility (rain, snow, fog) you don't need them to see ahead, but other drivers need them to see you. In some states it's law. Be first to turn on your headlights at dusk and last to turn them off at sunrise. In these partial daylight conditions when it isn't fully dark, you might even use high beams. Use your lights to communicate: Flash them rapidly at drivers who loom up in the semi-darkness ahead—unseen because they haven't turned on their lights. Do the same to alert other drivers to a dangerous situation. Use your emergency flashers to alert drivers behind you. Buy a car painted a "safe" color; light colors show best. Use horn only for emergency and then with a series of rapid taps; don't lean on it. Recognize drivers who communicate with you; a wave of the hand does wonders.





# Radio control without the roar

Wind-powered  
R/C models  
offer quiet  
excitement  
on water and  
in the air.

by Stephen  
Walton  
ASSISTANT EDITOR,  
HOME AND SHOP

Photos: below,  
Jose Corre;  
others, except  
4, Diana

If you like the idea of using nothing but the wind for motive power and making it put graceful vehicles through maneuvers, for fun or for competition, you can try sailing and soaring in miniature with sophisticated radio-control models assembled from kits.

R/C model yachting is an appealing sport because it combines craftsmanship and seamanship, with the payoff of head-to-head competition under rules virtually identical to those used in full-size yacht racing. Several classes of model yachts are well established, with class championship regattas held annually, and you can put a raceable boat into the water for considerably less than the price of a full-size sailing dinghy.

R/C model soaring has been around for a while, but the introduction of the Hobie Hawk sailplane promises to create a boom in the sport. Made by Coast Catamaran (the Hobie Cat people), the Hawk is sturdy, competitive and available both in kit form and ready to fly.

Although I'm strictly a novice modeler, I was able to build and successfully operate both a kit-version Hobie Hawk and a Huson 36 model yacht, a kit-built boat in a recognized racing class.

What are they like to operate? Very different.

Learning to fly the Hawk without an instructor would be like learning to ski without one—you could expect to break something. A Hawk flight starts into the wind with a toss

from the top of a ridge (that produces an updraft) or on a towline hauled in either by an elastic shock cord or a motor-driven winch. Once it's up there—1000 ft. on a shock-cord launch is not uncommon—and off the tow, a beginner can take the

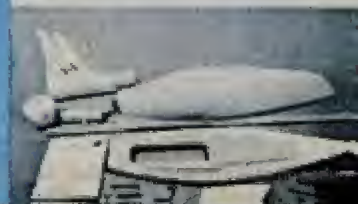
stick. First you learn to keep the sailplane pointed into the wind with the rudder alone, then you progress to making wide, sweeping turns—moving the rudder to initiate the turn, adding some up-stick to compensate for the tendency of the nose to dip (because the rudder is also acting partly like an elevator while the plane is banked, and lift from wings is reduced), then returning rudder to neutral while holding the elevator position to complete the turn.

Learning to handle stalls and dives comes later, as do tow launches (when an otherwise stable plane can display quirky behavior) and non-violent landings. Make sure your teacher is near enough that he can grab the stick if you go into a spiral dive—and you're bound to go into a few while learning. An expert pilot can put the Hawk through some pretty fancy aerobatic paces and bring it in for a one-handed catch—and he can use thermal updrafts to stay aloft as long as the charge in his radio-control batteries will permit. That and precision landings are what sailplane competition is about.

You can solo with an R/C yacht right away. Once you get your jib-slot adjusted so that the boat sails straight with minimal rudder correction, you can practice running a figure-eight course between two marks, learning when to ease out and when to haul in the sails. Then you can start practicing on a triangular course and learning the racing rules. And you will benefit from getting a seasoned skipper's advice before you start racing.

The American Model Yachting Assn. is a young, aggressive organization with about 1500 members, nearly 50 member clubs nationwide, and 65 sanctioned regattas on its 1975 schedule. Annual dues are \$5, and AMYA's new-members packet provides a thorough introduction to the sport, with information you'll





1. Action with 50/800-class yachts during a club race. 2. Author's Hobie Hawk sailplane ready for towline launch. 3. Hobie Hawk in flight. 4. Huson 36 yacht, one of few boats available in full-kit form. 5. Hobie Hawk kit contents. 6. Huson 36 kit contents, with Harris sail control unit, sold separately, at lower right.

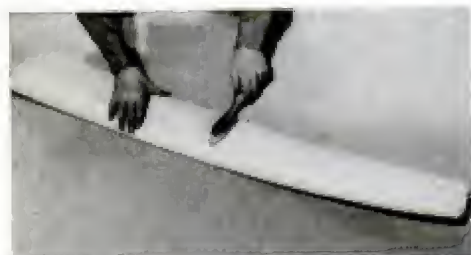


probably want before you begin to build a boat.

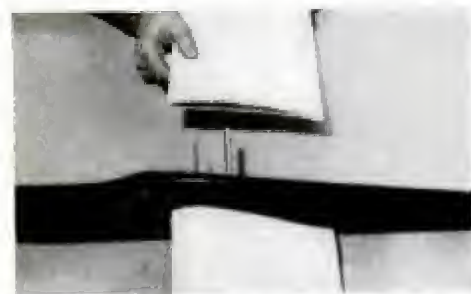
Building the 8-ft.-wingspan Hobie Hawk from the \$99 kit is relatively simple, as major sections are pre-assembled—three-part fuselage (polyethylene nose, fiberglass tail cone, ABS tail) and wings and tail surfaces ( $\frac{1}{2}$  and  $\frac{3}{4}$ -in. plywood over-high-density foam). You finish the fuselage, attach wing, rudder and elevator tips, sand surfaces and cover them with plastic film such as Super Monokote, and install radio gear (control linkages are provided). The



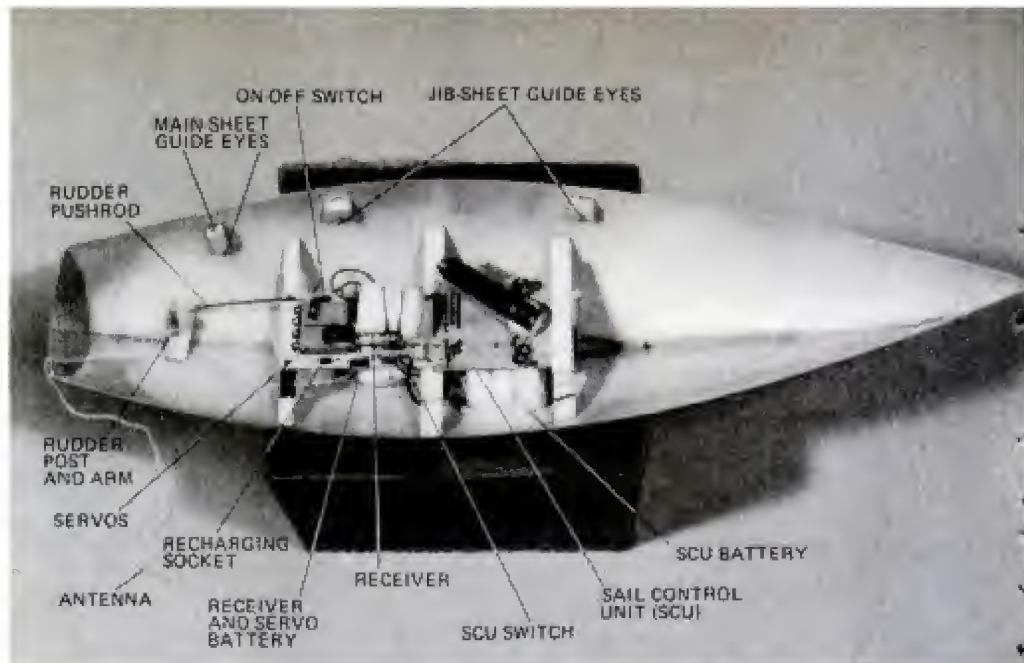
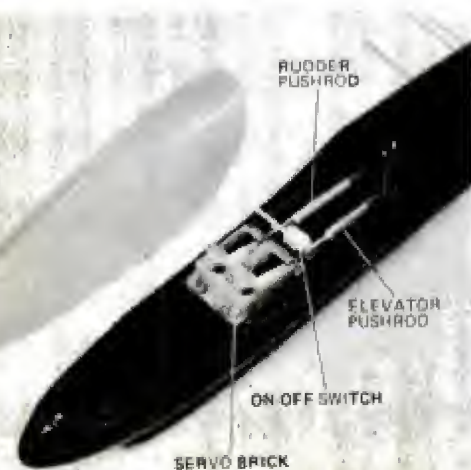
Iron-heated Super Monokote covering is stretched and sealed to wingtip curve.



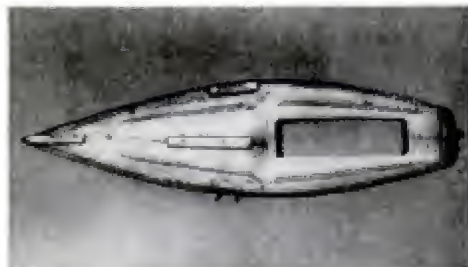
Film stretches drum-tight over wing panel with heat; makes smooth, glossy surface.



Wings slide onto rods through fuselage—factory-finished wing roots give correct angle of attack for flight.



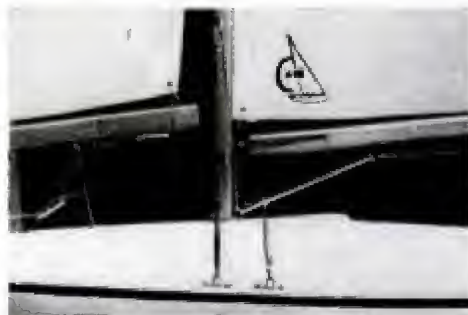
Mechanical crew of model yacht as seen before deck is put on; radio gear and SCU will be removable through hatch. Sheets are attached to SCU with deck in place.



Wood blocks are fastened to underside of deck and fittings screwed into them.



Deck, hull are permanently joined with epoxy or resin mixed with powdered glass.



Turnbuckles, cleats, bowsers provide for adjustment of rigging, sail tension.



With transmitter and receiver on, hatch cover secured, author launches yacht.

For more information: AMYA, Eugene "Bud" Salika, 3917 Sunnyside Ave., Brookfield, Ill. 60513. Model Yacht Racing Assn. of America (sanctions nonradio racing as well), Jerry Dunham, 83 High St., Orange, N.J. League of Silent Flight (membership earned by demonstrating soaring skill), Box 39068, Chicago, Ill. 60639. National Soaring Society (competition-sanctioning body), 46 Oakcrest Dr., Dover, Del. 19901. Academy of Model Aeronautics (provides liability insurance for members), 806 15th St. N.W., Washington, D.C. 20005. Manufacturers: Coast Catamaran (Hobie Hawk), 2026 McGaw Ave., Irvine, Calif. 92705. Leisure Products (Huson 36), 6920 Braddeck Rd., Annandale, Va. 22003. Harris Engineering (sail-control units), 7528 Dunston St., Springfield, Va. 22151. RS Systems, 850 West Barkley Ave., Orange, Calif. 92667. Kraft Systems, Inc., 450 West California Ave., Vista, Calif. 92083. Carr Sails, 7607 Gresham St., Springfield, Va. 22151.

Hawk cockpit with radio system installed looks uncluttered—receiver and battery are in the nose below the deck, and the charging plug is on the fuselage belly.

two-channel RS system I installed, designed for sailplanes, sells for \$170. (If you're in a hurry, you can buy the finished Hawk, less radio, for \$149, or ready-to-fly for \$339.)

The Huson 36 yacht kit, at \$125, includes fiberglass hull, deck and keel, wood for mountings, spars and 4-ft. mast (you laminate it), all fittings, rigging cable, running lines and ready-made Carr sails. You add a sail-control unit (R/C servos lack the power needed), like the Harris Engineering Little Herc (\$46 assembled, \$34.95 as kit), ballast and radio gear. I used a Kraft system (\$219.95 retail) with heavy-duty servos and a three-channel transmitter (unused third channel is sometimes set up for separate control of jib-sail) with separate sticks for the rudder and sail-control unit. ★ ★ ★



# Preview of Detroit's '76 models

Yes, there will be a 1976 model year for the Detroit auto-makers. Some cars obviously are just variations on a theme, but they are still worth looking at. Others, which no one outside the factory has seen, won't be ready until later in the year. But enough is known to visualize them—as artist Harry Bradley has done here.—*Bill Hartford*

## Cadillac Seville coupe

GM has a hot one in the new Cadillac Seville. Now there's a coupe version in the works that might be ready as early as spring '76. The Seville (or "M" body) will have to be shared with the other GM divisions. Buick and Olds will have their "Sevilles" soon.

## Compact Lincoln

Seville's success will force the Lincoln-Merc. Div. to go small with a luxury model. It can't be much like a Monarch and can't be a Continental/Mark mishmash. A stretched Monarch shell (Seville is a stretched Nova shell) with clever exterior styling might carry off the masquerade.

## Plymouth/Simca hatchback

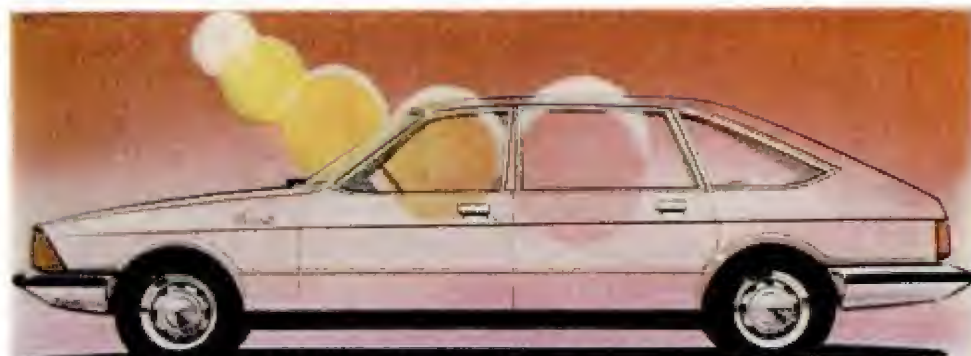
The Chrysler-Plymouth and Dodge boys have strong compact-line models, but are short in subcompacts. Dodge does have the Colt from Mitsubishi, but Plymouth is wanting—the new front-wheel-drive Simca 1300 could be just what Plymouth needs. All it would require for the United States is an engine of about 1900-cc displacement.

## Dodge Aspen

Among the Chrysler-Plymouth and Dodge models that'll be introduced soon (and shown in the October issue) are two brand-new entries: the Dodge Aspen and Plymouth Volare. Essentially they'll be Darts and Valiants given a luxury treatment.

## GM mini-van and pickup

Street rods, dune buggies and other oddballs have moved over to make room for the latest fad: the van. Van people have been doing such slick work with their big boxes that Detroit had to take notice. Enter the mini-van from GM which has a "now" look and will be more economical to own and operate.





# PM'S DESIGN-A-BODY CONTEST WIN THIS ELECTRIC-CAR CHASSIS

With its successful little electric Elcar already appearing on the streets of America (see facing page), the Elcar Corp. now distributes and sells its chassis without a body for do-it-yourselfers who want to design the exterior and finish the car.

It's this \$1700 unit pictured here that you can win if the body you design is judged best in PM's Design-a-Body Contest.

In a car of your own design, you'll enjoy the unique experience of humming silently along at speeds up to 35 mph, propelled by a battery-driven  $3\frac{1}{2}$ -hp, 2000-watt motor capable of developing 6 to 7 hp.

After some 30 miles of errands, plug the charger cord into any handy 110-v. outlet and in seven or eight hours you'll be all set to start rolling again—at an energy cost of about  $\frac{1}{2}$  cent a mile.

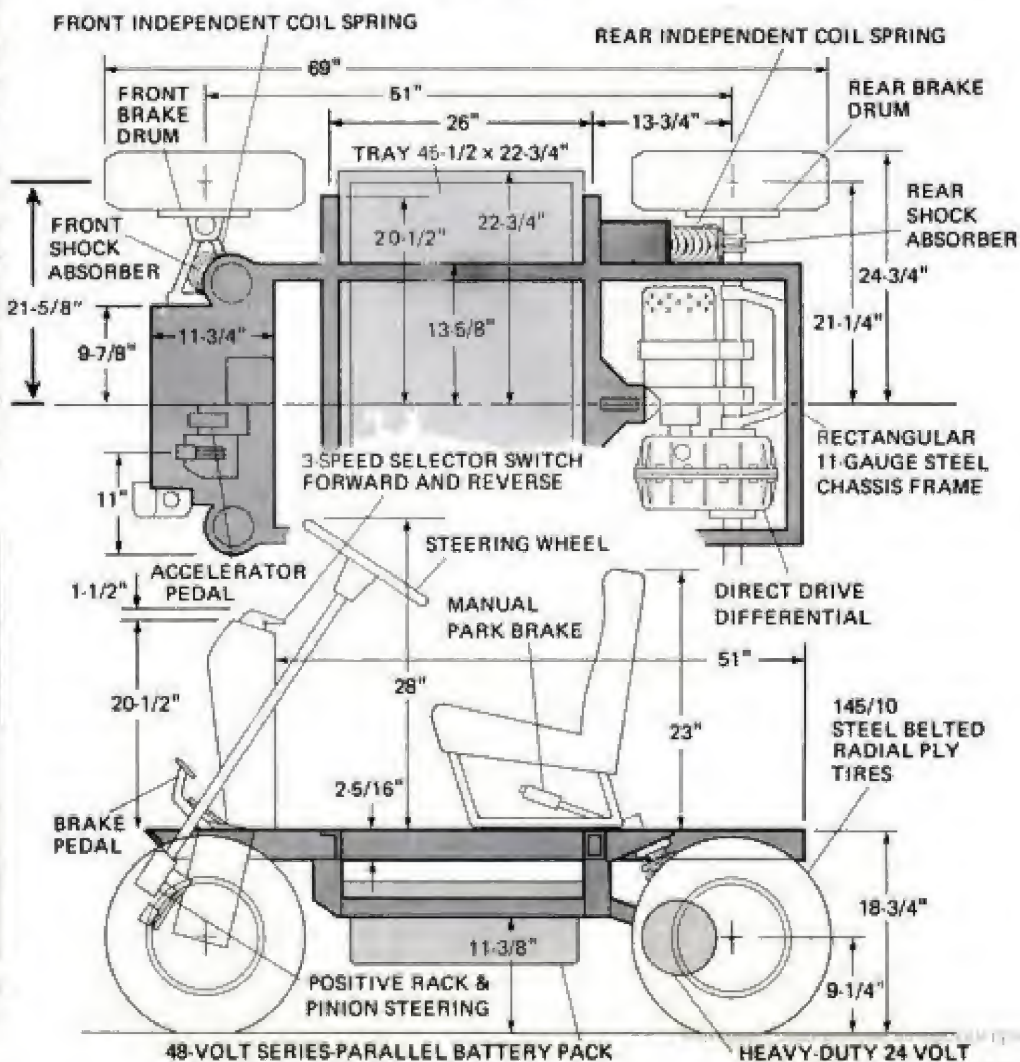
This rugged little vehicle is no golf cart conversion. Its tough chassis, steering and suspension are adapted from the small Fiats, and it is manufactured by Zagato. The Model 2000 chassis has independent coil-spring suspension in front and semi-independent in the rear, with shocks all around anchored to frame of 11-gauge channel and angle steel. The tires are Michelin X2 145 SR10s,



Art: Fred L. Wolff



Elcar Model 2000 chassis will go to the PM reader who submits best body design.





good for 40,000 miles. That is the basic unit you can win!

Using chassis diagrams and dimensions at right, design a body for it according to the rules set forth, and send your scale drawings to PM Electric Car Body Contest, 224 West 57th St., New York, N.Y. 10019.

There's no need to buy anything but paper and pencil; this is a design contest, not a building project. If your design is judged best, the Elcar chassis shown here will be shipped exactly as it is sold for the do-it-yourselfer (that's minus batteries and charger) to the address you designate.

The winning chassis will come to you with all the control wiring installed. Diagrams and instructions for tying in the few remaining wires for lights, turn indicators, wipers, radio and other elements that may be included in the body you design, will be provided by the Elcar distributors with the chassis.

You don't need professional design experience to win this contest. The judges will not be looking for polished art, nor will "professional quality" in the design sketches be a consideration in picking the winner. Concept and practicality (including do-it-yourself simplicity) are the vital factors.

Contest rules are as follows:

1. All entries must be postmarked on or before Sept. 15, 1975.
2. Sketches must be drawn to accurate scale—one inch equal to one foot.
3. All entries must include the following:
  - a. Top view, with passenger seating arrangement and cargo stowage areas indicated by dotted lines.
  - b. One side elevation (driver's side); one front and one rear elevation—all showing seat configuration in dotted lines.
  - c. All diagrams must be drawn to conform to given dimensions of the chassis diagram shown here, and body attachment points to the chassis should be indicated.
  - d. Materials used to make the body, and methods of fabricating the various panels and parts, must be indicated in the legends on the drawings. Hardware must be specified and ways of mounting body indicated.
4. Your name and address must appear on every sheet of drawings and descriptive data submitted, and must be inscribed on any scale model you may volunteer to send in.
5. Automotive or other industrial designers who make a living at either profession and *Popular Mechanics* employees and members of their families are not eligible to compete in this contest.
6. The contest is void in states, counties or localities where such contests are legally prohibited or restricted.
7. All entries become the property of *Popular Mechanics*, and only one prize will be awarded.

There are no rules against building a scale model or prototype to prove the viability of your design. But they are not required. Your de-

(Please turn to page 121)

## ROAD TESTING THE ELECTRIC CAR

by Richard F. Dempewolff

When you climb aboard the boxy little two-passenger, fiberglass-bodied Elcar, as I did recently at its American home base in Elkhart, Ind., new driving sensations begin.

The Elcar is an import from Italy, made in Milan by Carrozzeria Zagato, noted producer of prototype sports cars. In Europe, it's known as the Zele. It comes in two models—series 1000 and 2000. In the back of Elcar's Indiana headquarters there's a prototype four-passenger model of the car which will be produced in this country by early next year. But more about that later.

The one I drove was the Model 2000, which sports a 3½-hp motor, has a claimed top speed of 35 mph and maximum range of 30 miles before you have to plug it in and recharge the batteries. The series 1000 has a 2½-hp motor, a top speed of 25 mph, but a range of up to 50 miles between chargings. Both models work off a solenoid-operated speed-control system feeding, in successive stages, 24, 36 and 48 volts to the motor from a pack of eight standard 12-volt lead acid automobile batteries.

While I wouldn't exactly call the Elcar "cute," it has definite eye appeal and "character." It looks like a mini-tractor for a missing mini-trailer,

brightly colored (choice of seven shades) with sliding windows, headliner and a roomy, uncluttered interior. For all its compactness, the boxy little cabin boasts a surprising amount of leg and headroom. But the real surprises come when you get in and start driving.

When I turned the key, nothing whirled, hummed or started going. All I'd done was unlock the steering and open the circuits for subsequent procedures. At the top of a squarish post on my right there's a dial with a hand-rotated pointer arm. The dial is labeled R O 1 2 3—obviously the transmission switch: reverse, neutral, and three forward speeds.

Each dial position, I discovered, has two progressive speeds, for a total of six speeds forward and two in reverse. As you climb through the forward ranges, accelerating as you go, the throttle must be let up for each position change on the dial control—like shifting gears without a clutch. There's a lusty whine from the motor as it labors to gain speed in each range. But once I hit top speed the

(Please turn to page 121)



**PM reporter** Dick Dempewolff prepares his test drive of Model 2000 Elcar (upper left). Note central control console containing knob with which you dial choice of neutral, reverse or three forward speed ranges. Bank of eight batteries slides out in tray under body for easy access (lower left). At upper right the mini electric is plugged in for an overnight recharge. Photos at lower right show expanded four-seater hatchback model in prototype form.



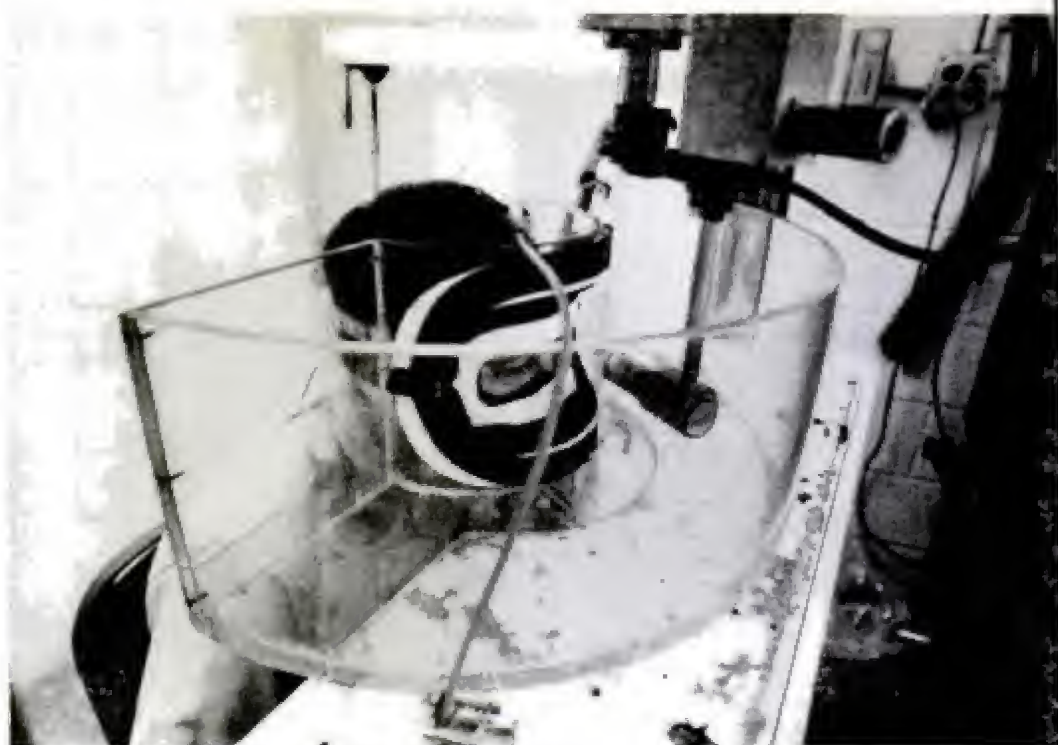


Kelly N., like a lot of 11-year-old boys, got into a fight at school. When the other boy hit him on the right side of the head, Kelly collapsed. At the emergency room of San Francisco's Mount Zion Hospital, he was X-rayed for a possible skull fracture. No fracture showed and Kelly was sent home.

Later in the day, Kelly became groggy and his father brought him back to the hospital. Suspecting internal bleeding, the doctors drilled into Kelly's skull to relieve the pressure on the brain. By this time it was too late. Permanent brain damage left Kelly mute and paralyzed from the neck down.

The boy's family sued the hospital for not having diagnosed the internal bleeding in the initial examination, when immediate surgery might have saved Kelly from being crippled. They were awarded more than \$4 million—one of the largest settlements of its kind, but small comfort to Kelly.

The tragedy might have been



Silently and painlessly, ultrasonic waves from transducer probe a patient's eye.

## How science sees with sound

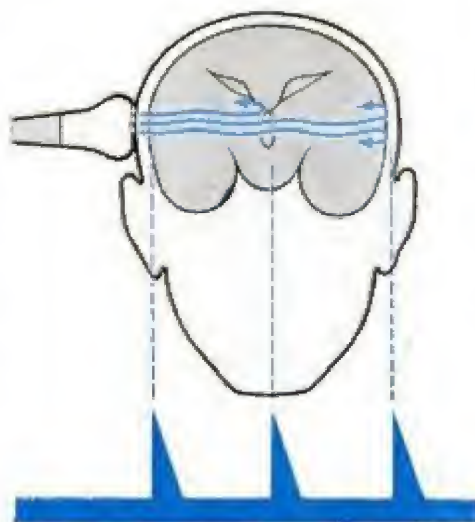
Using ultrasound, says a researcher, is like putting the doctor's eyes inside the patient.

by Hans Fantel

averted through the use of ultrasound, the newest medical technique to detect hidden injuries and ailments.

Contrast the case of Kathy R., a one-year-old Pittsburgh girl who was just learning to walk when she slipped and fell on a freshly waxed floor. Since the child suffered no apparent injury, her mother felt certain that a hug and a kiss were all the remedies needed. But when Kathy grew dizzy and listless, her mother called the doctor who immediately took her to Presbyterian-University Hospital for an ultrasound checkup. There, Dr. Charles Grossman, one of the pioneers in ultrasound diagnosis, sat Kathy next to a knob-studded device resembling an elaborate TV set. He picked up a small pencil-like probe connected to the unit and just held it to the side of Kathy's head.

Ultrasound—sound waves beyond the range of human hearing—were now pulsing through Kathy's brain. The child felt nothing whatever, for ultrasound is imperceptible to any of the human senses. But on the monitor-tube screen, three luminous blips



Probe against side of head sends ultrasonic energy through the brain. By timing return echoes, the ultrasound machine indicates distance of reflecting objects. Doctors read blips on cathode-ray tube.

sprang up. "The two outside blips are sound reflections from the sides of her head," the doctor told Kathy's mother. "The center blip is the midline echo."

The midline echo, he explained, stems from the cleft dividing the left and right halves of the brain. Because this cleft is filled with spinal fluid, its density is different from that of the jellylike brain mass. When the sound beam hits this density difference along its path, some of its energy is reflected, just as light reflects from water or glass. By timing the returning echoes, ultrasound equipment tells the distance of the reflecting object.

Normally the doctor would have seen the midline echo exactly at the center between the two outer blips. In Kathy's case, however, the center blip had shifted to the right. Something was pushing Kathy's brain off center. Apparently, when she hit her head, a blood vessel ruptured on the left side and the resulting blood puddle in the confined space of her skull was pressing on the brain, a condition called subdural hematoma.

Thanks to this quick diagnosis, surgeons were able to drain off the accumulated blood before the pressure damaged Kathy's brain, and she recovered completely.

Until ultrasound, doctors had no fast and simple way of spotting such injuries. But with the ultrasonic device, the diagnosis can be made easily and without risk or pain.

"Each week we get about a dozen kids who've been hit by cars," says Dr. Marc S. Lapayowker at Temple University Hospital in Philadelphia. "We now do ultrasound on all of



When high-frequency sound waves "slice" into tissue, a mass like a tumor reflects a different echo than does normal tissue. The two sonograms shown here reveal a normal breast (far right) and one with a tumor (arrow) diagnosed as malignant.

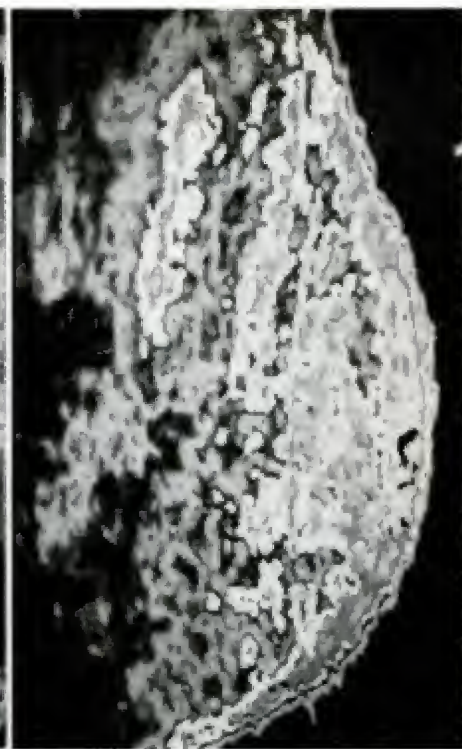
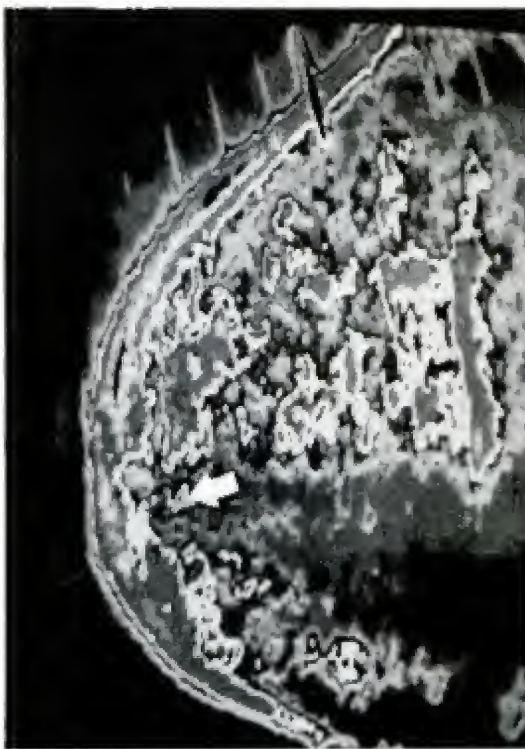


Dr. Gilbert Baum runs an eye-scan at Albert Einstein Medical College in New York.

them." He urges ultrasound checks of all traffic injuries. "Nearly every car crash or motorcycle spill involves some degree of head injury. When victims arrive in the emergency room, they are often unconscious, in shock, or plain confused. You can't ask them what happened or where it hurts. Ultrasound examination takes only a few minutes and may save serious complications later."

The principle of sonography, as this technique is called, is basically simple. High-pitched sound waves, as any bat knows, define objects in their path with considerable detail. At extremely high frequencies, ranging beyond a million cycles per second, sound also has the ability to "shine" through solids as if they were translucent. Consequently, ultrasound can be used to "see" into the human body if the sound reflections are electronically processed as video signals and displayed on a cathode-ray screen.

Unlike X-ray, ultrasound registers not only strong density contrast, such as bone against flesh. It also discerns more subtle differences in the texture of soft organs, such as the kidney, liver, spleen and heart, and can detect lumps, swellings and cysts deep in the body. "It's like putting the doc-



tor's eyes inside the patient," says Dr. Grossman.

The first device to make use of ultrasound was the "silent" dog whistle, invented nearly 100 years ago. Present ultrasound techniques are an outgrowth of Navy sonar. The doctor "sees" the inner anatomy of the fluid-filled body in the same way submarine hunters "see" their prey in the waters of the ocean on the sonar scope. Similar electronic methods are used to turn the echoes of searching sound waves into a picture of the "target."

Before they are aimed into the body through the transducer—the probe held against the skin—the high-pitched sound is electronically chopped into millions of very short tone bursts. After shooting off each burst, the ultrasonic device waits for the returning echoes, which are then picked up by the transducer. The return time of the echo determines its position on the monitor screen.

"This type of information is often more useful than anything X-ray can show," says Dr. Murray G. Smyth, director of biomedical research for the Smith-Kline Instrument Co. "Suppose we're looking at a tumor. All you can see by X-ray—if you can see at all—is a shadow picture, the kind you get by holding your hand between a light and the wall. Ultrasound, by contrast, tells you at once the depth at which the tumor lies within the body. And by sliding the transducer along the patient's skin, you can outline the tumor in all three dimensions."

The most recent advance in sonography—first demonstrated in 1974—is a new type of visual display

called "gray scale." By this technique, the relative strength of the echoes is reproduced by different shades of brightness on the screen. Moreover, the display is not just a set of blip-echoes. As the transducer is moved across the body, a memory device in the monitor stores the different echo-images. The stored echoes from different points are then combined to build up a composite image showing a total cross section of the body. "It's like slicing across a salami to see what's inside," quips one doctor. "Only the slicing is done with sound, not with a knife."

This type of sound imaging opens up important new diagnostic possibilities. A liquid-filled cyst or a fibroid mass, for example, throws back a different "gray scale" echo than a hard-packed lump, such as a tumor. Doctors can draw vital diagnostic clues from these differences. Eventually, they hope to be able to distinguish between benign tumors and cancerous growth by ultrasound alone. Some doctors speak of this concept as "sonic biopsy"—a way of sampling tissue without having to cut.

At Albert Einstein College of Medicine, Bronx, N.Y., Dr. Gilbert Baum uses a refinement of this technique for early detection of breast cancer. He assigns different colors to each shade of a gray in the sonogram (sound picture) and can then spot the presence of a tumor inside the breast by a characteristic color pattern. He is also working on a method to translate color and location on the sonogram into numerical data to be analyzed by computer. The computer would automatically print out a warning whenever it rec-



ognizes the typical tumor pattern. By putting the sound scans on video tape to be processed at a computer center, a large number of women could be screened quickly and inexpensively by lab technicians, and early detection of possible breast cancers could save many lives.

Women also benefit from ultrasound in other ways. It is one of the best ways to monitor a pregnancy—"by far the least troublesome kind of obstetric examination," observes Dr. Lester T. Hibbard of the University of Southern California. "No poking, no discomfort to the mother. Besides," he adds ungallantly, "most women in pregnancy are too fat to let the doctor feel the baby properly through the abdominal wall."

Ultrasound senses the fetal heartbeat as early as the eighth week of life, long before conventional stethoscopes pick it up, confirming whether or not the baby is alive. It also predicts the sex of the infant as early as the third month. Later in pregnancy, fetal position and head size can be checked simply by placing the transducer on the woman's abdomen, all without damaging X-ray. In that way, doctors can anticipate birth complications.

"We can arrange for cesarian delivery long before an emergency situation develops," says Doctor Hibbard. Ultrasound also discloses fetal abnormalities at an early stage, and the parents can then decide ahead of time whether to let a defective baby be born.

New medical applications of ultrasound are constantly being perfected:

- Heart specialists bounce ultrasound off the moving heart valves to watch their action and detect leakage or clogging. The sonogram also shows accumulations of fluid in the heart sack, which sometimes follows a hard blow on the chest and may have dangerous consequences. This type of hidden injury often occurs in car accidents when the steering wheel rams the rib cage.

- Internists sound out abdominal organs, often sparing their patients from the pain and cost of exploratory surgery.

- Eye doctors use ultrasound to locate foreign bodies that have entered the eyeball, especially when hemorrhage within the eye prevents the use of normal methods of examination.

Ultrasound also helps doctors see *behind* the eye. One kind of cancerous tumor—melanoma—grows at the rear of the eyeball and often looks deceptively like a detached retina, a blood clot, or just a harmless swelling. If a doctor has reason to suspect melanoma, he usually removes



**Fetus image** builds up on cathode screen as probe moves across patient's abdomen.

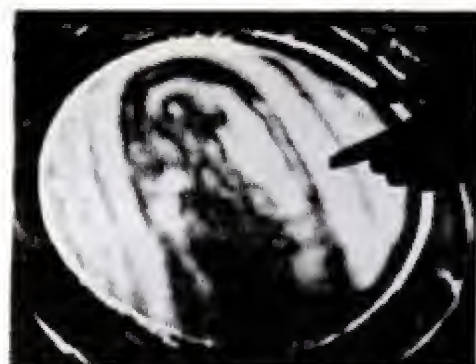
the eye rather than risk a life. But statistics (released by the Armed Forces Institute of Pathology) reveal that one out of five such eye removals proves unnecessary.

Ultrasound may stop this pitiful waste. A Finnish researcher, Dr. Arvo Oksala, has proposed methods to distinguish melanoma by ultrasound from other conditions that do not threaten life. Other ophthalmologists have joined this research which, if successful, could save countless eyes.

Telling harmless cysts from dangerous tumors by ultrasound is already an established routine in kidney examinations. At Downstate Medical Center in Brooklyn, N.Y., Dr. Joshua A. Becker has worked extensively in this field and also designed a new kind of ultrasonically guided surgical instrument. If he finds that a kidney swelling is merely a fluid-filled cyst, he uses a hollow needle equipped with an ultrasound transducer to drain off the liquid. Rather than having to poke blindly in the kidney, the ultrasound image on the screen lets him aim the needle directly at the cyst, thereby reducing the surgical trauma. In effect, the surgical instrument is sonar-guided toward its target like a torpedo is directed against the side of a ship.

Some ultrasound devices make use of the Doppler principle—the train-whistle effect of frequency shift from a moving sound source. If ultrasound is bounced off the blood corpuscles within an artery, the frequency shift of the echo tells the rate of blood flow. An ultrasonic flowmeter can thus be used to check the condition of blood vessels, particularly to examine blood flow in the legs and spot clot formation in the early stages.

The same technique is also helpful in locating aneurisms—thin places in the arterial wall that threaten to result in a "blowout." In such cases, a plastic bypass can be installed to prevent the risk of a massive internal hemorrhage.



**Blood vessels** and other details of fingertip are revealed in ultrasound "picture."

Despite recent progress, ultrasound diagnosis still faces problems. Not enough doctors have yet been trained in it. As one of them puts it, "Ultrasound is no smarter than the people who run it." In many cases, the sonogram provides only indirect clues, and doctors must learn to interpret the sound images in terms of the patient's illness. But sonography is steadily growing.

Inevitably this raises the question: Will ultrasound replace X-ray? Most doctors doubt it. "I regard ultrasound as a supplement, not a substitute for X-ray," says Doctor Smyth, voicing the majority opinion. "Ultrasound can do things X-ray can't, and vice versa."

But the long-range outlook seems bright. "Historically this is the age in which we must join the link between medicine and technology," says Doctor Grossman. "Within five years, I'm convinced, advanced ultrasound techniques will revolutionize diagnostic medicine. We still don't know the limits of what is possible." ★ ★ ★

## OTHER USES FOR ULTRASOUND

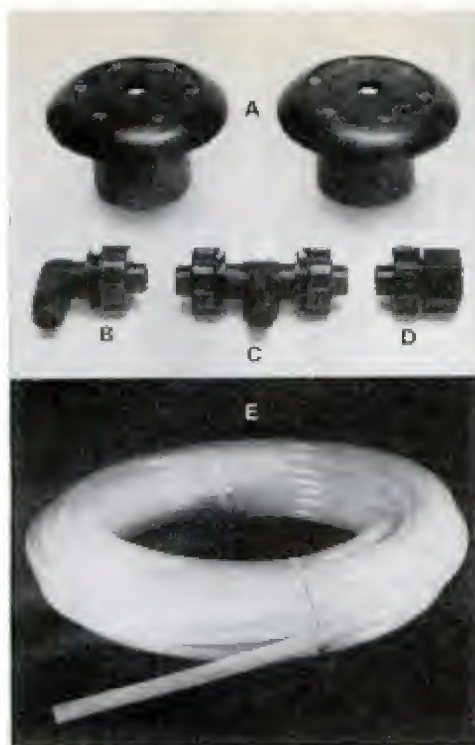
Frequencies beyond human hearing—that is, above 20,000 Hz—are widely used in industry for nondestructive testing. Rather than stressing materials to the breaking point, engineers now find hidden cracks and other faults by pulsing through the tested part. Having a different density, the crack or fault will return a telltale echo. Structural steel, aircraft parts, crankshafts and axles are among the many parts now routinely tested in this way.

Ultrasound is also used for cleaning and degreasing precision parts, since the sound vibrations bounce dirt and grease away from metal surfaces better than any cleaning agent. Ultrasonic drills, which are cutting tools vibrating at high frequencies, are used to drill teeth and jewels, and are very useful in drilling square holes. Ultrasound vibrations also help tenderize meat, "age" whiskey, homogenize liquids, kill bacteria and detect burglars. Scientists believe that many other applications remain to be discovered.



# 'Plant' this \$60 sprinkler system in just 4 hours

It attaches to an outside faucet and requires only a spade and garden shears to install.



Kit contains two rotary sprinkler heads (A), elbow fitting (B), tee fitting (C), faucet connector (D), 100 ft. of tubing (E), and instructions.

Simple enough to install yourself in a few hours with little more than a spade, a new low-cost, in-ground lawn-sprinkling system called Sprak-Rite goes together with connectors you simply tighten by hand.

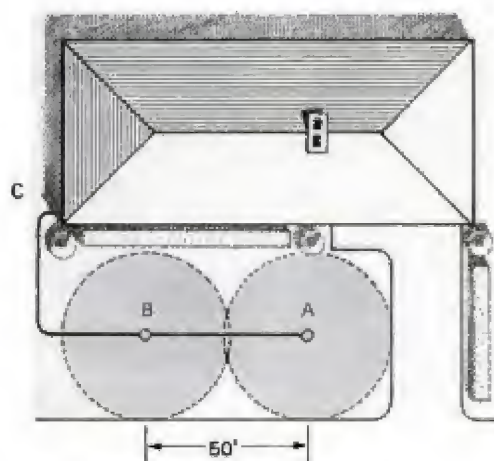
A starter kit (\$59.95) contains two pop-up rotary sprinkler heads, 100 ft. of flexible polyethylene tubing and three click-and-seal fittings to provide a system which will water a 50 x 100-ft. area. Extra add-on heads are available for use where greater lawn coverage is desired.

The system connects to an outside faucet like a garden hose and it will

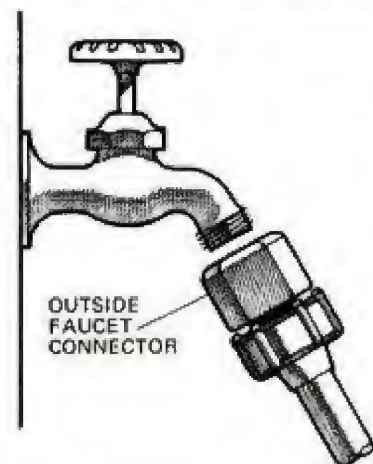
run on normal house water pressure.

The key to the system's simplicity is its unique nylon connectors. You simply push the plastic tubing into the fitting until it clicks, then turn the nut until it's hand tight.

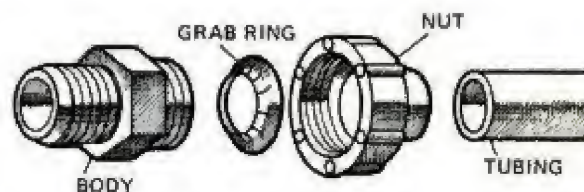
The system is assembled and tested on top of the ground. Then when the sprinkler heads are placed where you want them, you bury the line in a slit made with a spade—no need to dig up the lawn. The manufacturer is Mobile International, Inc., 16291 West 14 Mile Rd., Birmingham, Mich. 48009.—Wayne C. Leckey, *Home and Shop Editor*.



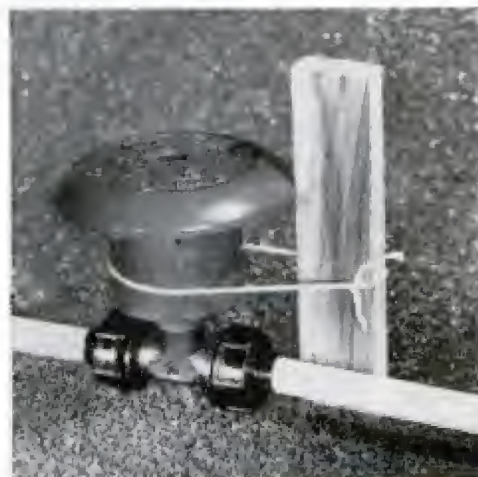
Position sprinkler heads A and B on lawn, connect with tubing, attach to outside faucet (C), then test until you find the best spray pattern.



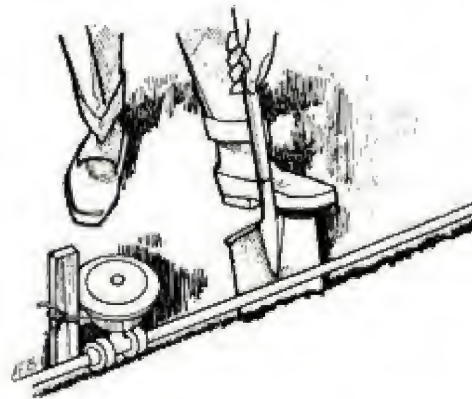
Flexible tubing running to sprinkler heads is attached to outside faucet like an ordinary garden hose with special click-and-seal connector.



Photos: Robert D. Borst

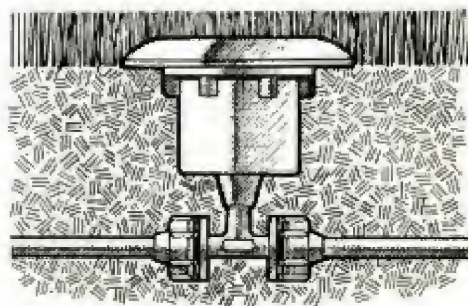


Full-circle sprinkler heads are temporarily staked in position to determine best spray pattern before complete system is buried.



Except for sprinkler heads, there's no need to dig up the lawn to bury the tubing. You just form a 6-in.-deep slit in the turf with a spade by working it back and forth. Tamp the soil back into place with your feet.

Watertight seal is made in seconds without solder or plastic cement. Simply insert pipe in fitting until it seats and locks by grab ring, then turn nut finger-tight. Below, sprinkler's 3/4-in.-high turf guard protects head from lawnmower.





# With lots of room and glass, Pacer has style that pleases owners

by Michael Lamm  
WEST COAST EDITOR

Passengers find my Pacer very roomy and comfortable," says a New York engineer, and that fact is one of the Pacer's biggest selling points.

Styling and roominess sold most Pacers to begin with—63.0 and 41.3 percent respectively. Here are some typical comments: "After seeing the actual Pacer and taking it for a test drive, we were very impressed with the roominess and ride."—Missouri airline supervisor. "I liked the design and shape of the car."—Indiana veterinarian. "I was taken with the new look and the inside room."—Alabama contractor. "Roomy; no blind spots; almost the same as a station wagon."—Illinois steelworker. "Vision is outstanding front and rear."—Texas technical manager.

Hand-in-hand with roominess, comfort came in for high praise. "Rear passengers find that they are not cramped," says a Texas insurer. "Has big bucket seats."—Illinois housewife. "Rear passengers get a very comfortable ride; very quiet."—Colorado retiree. "Easy to get into; good leg space."—Vermont publisher. "The only small car that doesn't give my wife a backache."—Wisconsin surgeon. "The first thing said as a passenger enters this car is: 'How can they put so much room into a little car?'"—Utah theater manager.

What about ride and handling? "The car rides hard—almost as hard as my VW," comments a Michigan collegian. But an Arkansas retiree counters, "Rides like a big, heavy car." "Bounces a little in the rear but handles very well, and I'm really surprised at how well it drives on both dry and wet roads."—New York hematologist. "It's maneuverable, easy to park, and smooth riding. I think the Pacer is one of the greatest compact cars to come on the market, bar none."—Michigan real estate saleslady.

Of specific complaints, gas mileage (lower than expected) came in No. 1, and power (not enough) ranked No. 4 at 20.2 and 7.6 percent, respectively. A Florida retiree noted, "It has less pickup from a dead standstill than other AMC cars I've owned, although my Pacer has the larger Six." "I would have liked a small V8," observes an Iowa teacher, "and I'd like a better under-hood arrangement. Sleek styling makes the engine hard to work on. Even changing the oil is quite an ordeal, and so is changing the filter."

A Georgia insurance adjuster: "Gas mileage is not sufficient at 17 mpg average." And an Alabama restaurateur: "Doesn't come up to the economy level we anticipated. We ex-

pected to get closer to 20 mpg in town and 25 on the road. So far it's between 14 and 18 mpg."

More minor gripes included: "No discount on sticker price."—Arkansas farmer. "With all that glass it's too hot in summertime. **Needs better ventilation.**"—Indiana stockbroker. "Poor grade of carpeting."—Missouri chemist. "Changing the No. 6 sparkplug amounts to a sporting proposition."—California electrical engineer.

Turning now to specific praises, the following are representative: "Easy to get around in."—Texas corrections officer. "Holds the road like a Mack truck, especially during local windstorms."—California specialty shop manager. "Ride is great, looks likewise, room is ideal."—Louisiana student. "Good roadability, spaciousness, visibility, ease of entry."—Illinois nurse. "I love it for the way it handles."—Illinois golf pro. And a California grader operator enthused, "The persons at American Motors should have high praise for their workmanship of the Pacer."

Speaking of workmanship and general quality, 64.4 percent of our respondents rated it good to excellent and 35.7 average to poor. "Windows and trim could fit better."—Houston retiree. "It's the Cadillac of small cars."—Colorado art student. "Dimples in metal, weld spots, poor paint."—Detroit busman. "Everything seems put together very good."—Oregon railroader. "Well assembled, very solid."—Wisconsin housewife. "The mechanics are very good, but my Pacer came with many loose screws, strips of plastic, and a loose door panel."—North Carolina textile industrialist.

An interesting summation of the Pacer's workmanship came from a retired AMC manufacturing engineer who lives in Kenosha, Wis. He wrote, "Workmanship is fair by my standards and average by others'. Sloppy in areas like hose routings and wiring. Quality problems in final assembly are typical of the auto industry in general, due to tight production schedules, ill-trained workers and poor attitudes. Improvements can perhaps be achieved through co-operation between management and the

▶ An oft-repeated comment—just not enough air going into the passenger compartment.

▶ Many owners feel the Pacer's modern look will usher in a "futuristic" era of Detroit styling.

▶ Lapses in workmanship were mostly on appearance items.

▶ Huge doors (passenger's bigger than driver's) make getting into the back seat easy.

▶ Mostly rave reviews, with surprisingly few grumbles for a first-year car.

▶ Here's a frank appraisal from a guy who ought to know.







A nationwide survey based on 1,000,000 owner-driven miles



**Styling and comfort** rank tops with Pacer owners, but fixed windows and meager ventilation came in for some black marks. Door-lock buttons are convenient.





unions." When asked changes they'd like to see, Pacer owners told us, "I'd like front-wheel drive."—Minnesota student. "A four or five-speed transmission."—Ohio clerk. "Four-wheel disc brakes."—Kentucky grower. "Some sort of trunk so small items can be hidden out of sight."—Illinois electrician. "A four-door Pacer."—New York milkman. "A Pacer station wagon."—New Jersey bottler. "Larger glove compartment, better fresh-air intake, shorter turning radius, and remove the blind spots at main door pillars."—Indiana aviation technician. "Better gas mileage."—New York manufacturer. "Driveshaft tunnel is too high and too wide."—New York engineer. "Give us an eight-cylinder engine and stiffer suspension."—New York electrician. "I would prefer a four-cylinder engine."—Illinois student.

More suggested changes: "Optional sunroof and a place for a ski rack."—Michigan promoter. "Ashtray should be higher so you don't have to reach to put out a cigaret."—Michigan teacher. "The cost. As with all American and foreign cars, it's too expensive."—Minnesota warehouseman. "Tailpipe should run over the rear axle instead of under it."—California student.

On the topic of dealer service, 67.7 percent of our owners rated it good to excellent. AMC's **Owner Protection Plan** got good reviews and was often mentioned. "I took my car in on a hot day with no appointment," states an Illinois engineer, "and they fixed my air conditioner in five minutes. Thanks, AMC." "My dealer offered me a loan car without me asking, and I got immediate service."—Wisconsin patternmaker. "We were *very* impressed with the dealer's service personnel and his evident desire to correct our binding shift linkage and clouded windshield."—Illinois student. "I rate service as good, but parts had to be ordered for my next visit to the dealer."—New York methods engineer.

To conclude, here are random comments by assorted owners. One in Georgia says, "As an interior designer, I needed a small car with good gas mileage. I've always driven Cadillacs, Oldsmos, and most recently a Buick Riviera. The Pacer is as comfortable as any of them and as roomy as the Riviera."

"The Pacer fits our family like a shoe. My wife wanted a small car, and this is the only

Many owners said they wouldn't change a thing about the Pacer.

If Pacer had gotten a Wenkel and fwd as originally planned, there'd be no hump.

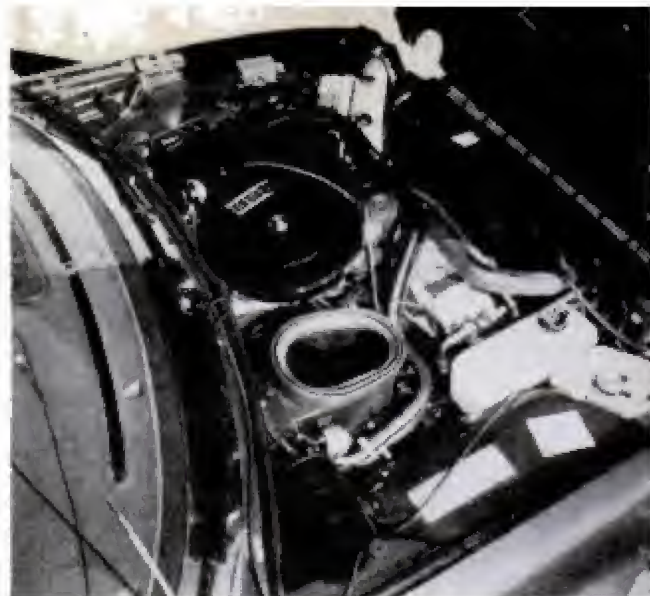
Too expensive—people simply feel they're not getting their car dollar's worth any more.

Most owners say they get same-day service or loaners when they have to leave their car overnight.

Only a telephone switchman would think of something like this.

Dealer stocks of Pacer body and trim parts were still low when we sent questionnaires.

Families consider it more a fun car than the family bus, but it does well as both.



Changing the No. 6 sparkplug makes a "sporting proposition," according to one owner. The oil filter is also tough to get at. The spare is hidden, but owners would like to have a hidden lockable storage compartment. The fuse panel is within easy reach in too-small glovebox.

one we could find with room for our two large boys in the rear. I also like the silence and the styling."—California traffic engineer.

"Pacer spelled backwards is Recap."—Georgia telephone switchman.

"It's my wife's car. It's one of the quietest riding and easiest handling cars I've ever driven. We like the performance and get a lot of second looks. Our three kids—practically teenagers—have plenty of room in the back. We get quite a kick out of having a family fun car."—Alabama paperworker.

No fewer than 87.7 percent of our respondents said they'd buy another Pacer next time—quite a high figure considering the size of the car and the fact that many owners have growing families. ★★

## Summary of 1975 AMC Pacer Owners Reports\*

Total miles driven 1,003,639

Average miles per gallon:  
232-cu.-in. Six: Local driving 17.3  
Long trips 21.8  
258-cu.-in. Six: Local driving 16.3  
Long trips 19.9

Engines  
232-cu.-in. Six 36.0%  
258-cu.-in. Six 64.0%

Transmission  
Automatic 72.3%  
Manual 27.7

Why the Pacer?  
Style 63.0%  
Room/Comfort 41.3  
Economy 40.6  
Size 24.9  
Ride 18.1  
Handling 23.8

### Specific likes:

Handling 56.7%  
Style 48.3  
Comfort 42.4  
Room 30.0  
Visibility 27.2  
Ride 25.5

### Specific dislikes:

Fuel economy 20.2%  
Workmanship 12.6  
Rattles 7.6  
Lack of power 7.6

### What changes would you like?

Gas mileage 11.6%  
Vent system 7.2  
Style (windows) 5.7  
Workmanship 5.7

### Number of vehicles owned:

Pacer only 41.8%  
Two cars 44.9

Three cars 11.2  
Four or more cars 2.0

### Other cars owned:

Chevrolet 14.0%  
Buick 10.5  
Oldsmobile 9.9  
Ford 7.6  
Pontiac 6.4  
Volkswagen 6.4

### Workmanship opinion:

Good to excellent 64.4%  
Average to poor 35.7

### Dealer service opinion:

Good to excellent 67.7%  
Average to poor 32.3

### Had any mechanical trouble?

Yes 59.5%  
No 40.5

### What type of trouble?

Transmission 10.9%  
Airconditioning 9.1  
Oil leaks 9.1  
Shift 8.0  
Power steering 8.0

### Did you repair it yourself?

No 98.3%  
Yes 1.7

### Dealers repairs satisfactory?

Yes 73.9%  
No 26.1

### Age distribution of owners:

15-29 years 30.4%  
30-49 years 44.7  
50 plus 24.7

### Family size:

1-2 people 43.8%  
3-4 people 42.5  
5-6 people 12.2

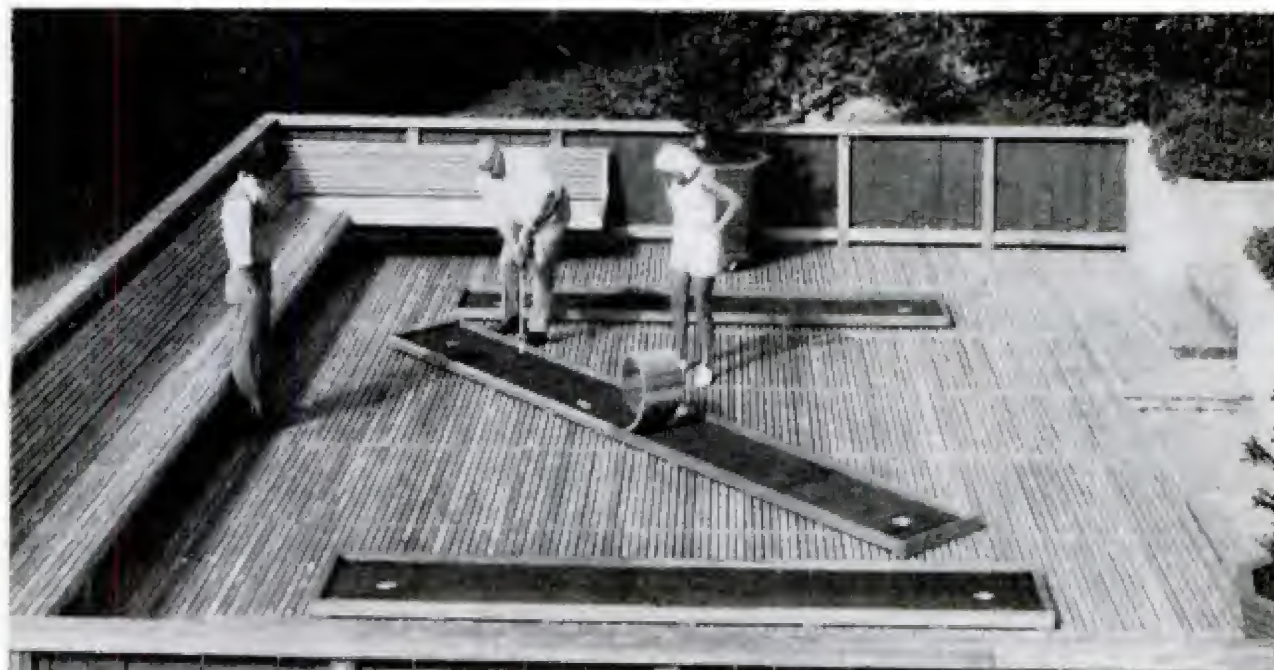
### Would you buy another Pacer?

Yes 87.7%  
No 12.3

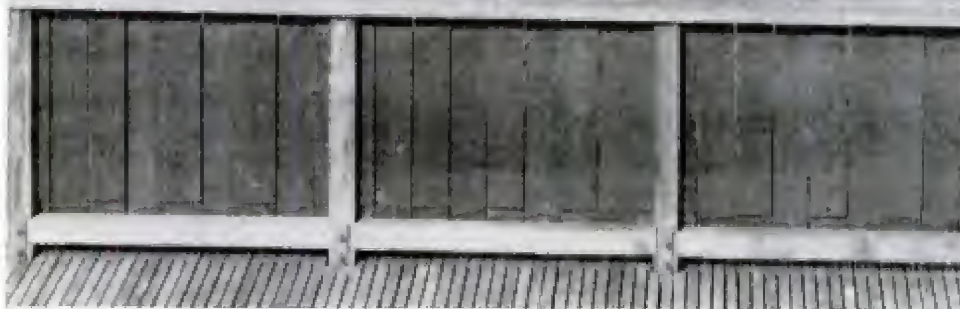
\*Percentages might not equal 100% due to rounding or insufficient data



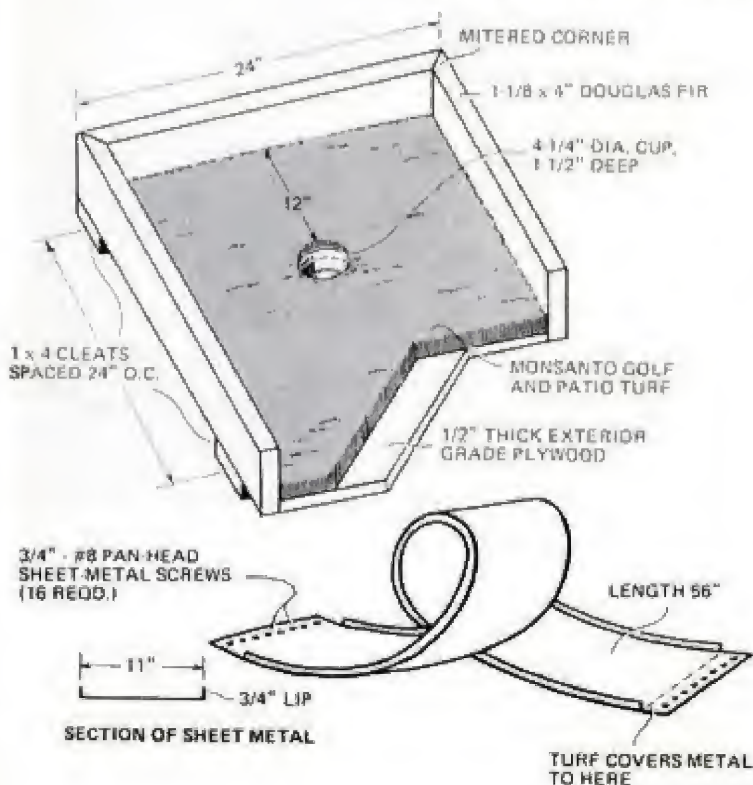
# Patio putting green you can build in a day



Photos for PM by Western Wood Products Assn.

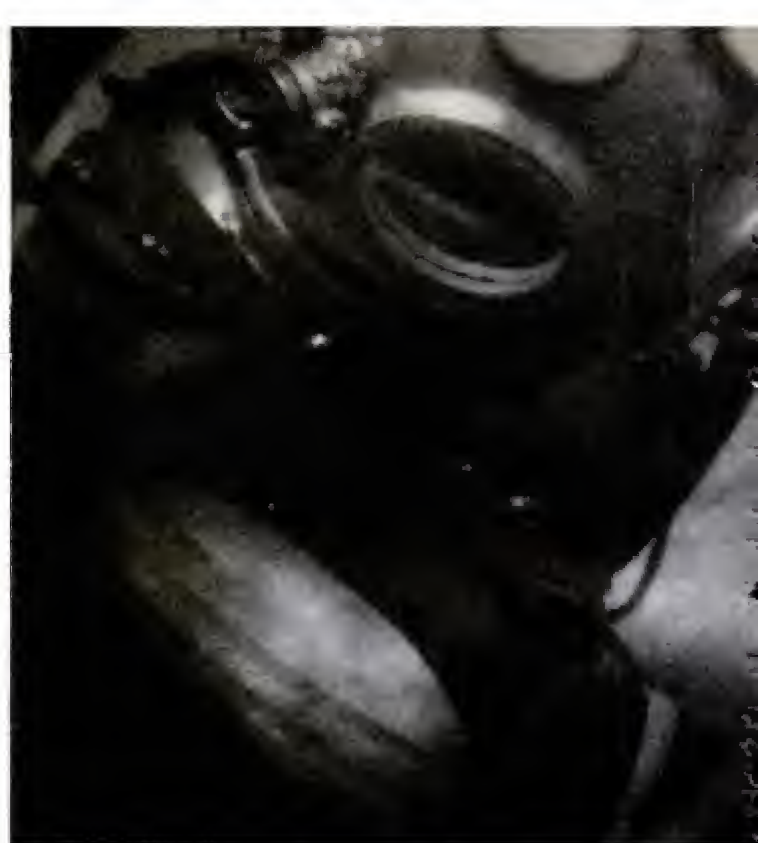


**Inclement weather** won't force you to cancel your golf practice sessions if you build one or more of these portable putting strips. Use them on deck, lawn or in your family room.



**T**welve months a year golfer Al Disdero of Portland, Ore., plays on his putting green, almost daily, indoors or out. The designer and builder of the putting strips shown here says any patio putter or deck duffer can do the same. Two strips are 12 ft. long with 10-ft. putts, while the trickier version is 14 ft. long—with a 16-ft. putt. This is achieved with a loop-the-loop fashioned from sheet metal that's intended to be a hazard unlike anything you're likely to encounter on the golf course. The artificial green is Monsanto's golf and patio turf; each strip is 2 ft. wide and has cups set in 1 ft. from both ends. The cups are made by cutting 1½-in.-deep sections from coffee or juice cans about 4¼ in. in diameter. The turf is glued to a base of ½-in. exterior-grade plywood. To keep errant balls on the greens, strips are framed with 5/4 x 4-in. (nominal) Douglas fir nailed to plywood edges. A 12-ft. putting strip can be built for about \$50 worth of materials, Disdero says. The longer strip will cost slightly more.—*Mel Blais*





## The training is tough, but so is the work: offshore diving

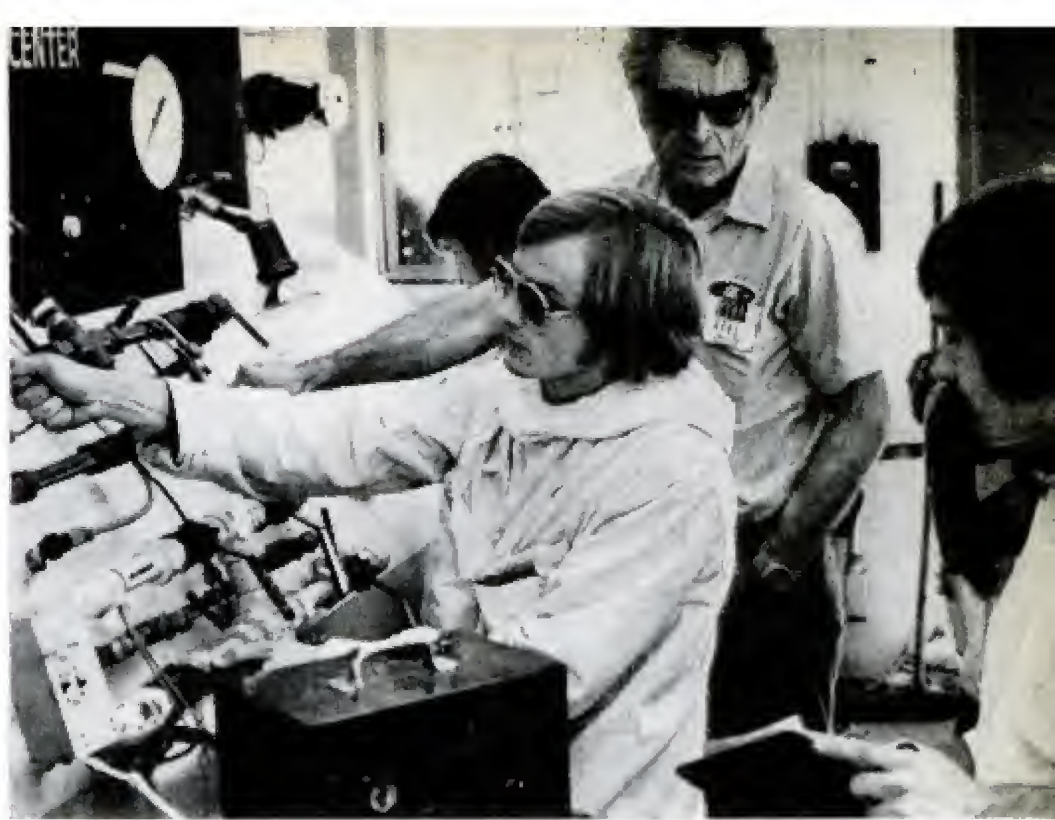
by John F. Pearson    SCIENCE EDITOR

"Gone are the days when you could take almost any dum-dum off the street, put him in a suit and send him down to blow bubbles. Diving—especially in the offshore oil fields—has become too sophisticated and expensive for that."

The speaker was Jim Joiner, director of the Commercial Diving Center in Wilmington, Calif., one of a handful of schools that train men to make a living as professional divers. "Seventy percent of our graduates have jobs waiting for them when they get out," Joiner told me. "And most of those men—about 80 percent—go overseas immediately." The accelerated drive to tap offshore oil all over the world has created a shortage of qualified diving personnel.

Last year, CDC received inquiries from some 9000 prospective students, 700 of whom followed up with a personal visit. About 400 students are trained





annually in two main courses: air/mixed-gas diving (the primary course) and bell/saturation diving. Underwater photography is an optional offering.

The first obstacle encountered by the aspiring diver is in the person of Warren Mahr, admissions director, a peppery retired Army officer who talks in machine-gun bursts as he gives out information about the school, veterans' benefits, possible student loans.

I got a sample of his style early on the first day of my visit to the school when he broke off our conversation to take a call from a young man in Michigan.

"You say you've done some sport diving," Mahr said. "Okay, let me tell you a few things about the diving business. There's an abominable bomb-out rate. Diving's a harsh life. You've got to put up with isolation, boredom—no women, no booze, no fun. If you're married, you've got to accept the fact that you'll be offshore and away from your family some 250 days a year. The divorce rate is terrific.

"It all adds up to this: Out of every 10 men who come into the business, only four are left after two years."

Mahr warned the caller that it would take time and experience before he could hope to earn good money.

"You work as a diver's tender for six months, a year or maybe more. You look after the diver's gear, help him suit up, handle his lines. It's an apprenticeship."

Mahr never fails to stress that the tuition at CDC—\$1700 for the air/

mixed-gas course—works out to \$4.04 per hour. "You probably won't even be making that much six months after you graduate."

(A full-fledged diver can make from about \$15,000 to \$25,000 a year. A few top ones earn more.)

Joiner, Mahr and Gene Aaron, supervisor of training activities, do their best to weed out unlikely candidates. At an orientation lecture for a starting class, I heard Aaron tell the students that anyone who had second thoughts about the training should come to his office to hash them out. These efforts pay off in a low (5 percent) dropout rate.

Mahr recalls an Australian who changed his mind after attending one day of classes. I've made a mistake," he told Mahr, "and it's my own fault—not the school's. I realize I belong back home with my family." His tuition was refunded before he flew back to Australia.

Written tests in shop arithmetic and mechanical comprehension eliminate some potential students.

Commercial diving is a young man's game. Though the school accepts applications from candidates up to age 35 (18 is the lower limit), persons above 30 are discouraged unless their goal is to use a knowledge of diving to enhance a career in a related field.

The ideal candidate is in his early twenties, has a college education, demonstrated mechanical abilities and no medical problems. If he's made a living as a mechanic or welder, say, that's a good indication he can handle tools underwater.

Using tools is what commercial div-



**Dressed in lightweight gear**—wet suit and fiberglass helmet—student (opposite page) jumps off barge to carry out diving assignment. This equipment is used in much of the offshore-oil work. Student in heavy gear (top, left) replaces valve in section of pipeline located in the school's harbor-training area. Class (top) learns the workings of hyperbaric chamber under eagle eye of senior instructor Allen Nesbitt, former Navy diving instructor. The Navy is well represented on the Commercial Diving Center faculty. Diver (above) wears a popular lightweight helmet.



With the search for oil a global affair, increasing numbers of foreign students attend CDC. Photo below shows trainees from Israel, Finland, the Netherlands and Norway. Here they function as a bell-diving team. The decompression chamber is behind them and the bell can be seen in back of standing student. The fully operational system can be used for diving to depths of 300 feet. Author (center photos) is shown before (wearing helmet) and after his dunking in training tank. The heavy gear he wears weighs about 200 pounds. The 40-foot training barge is used for open-water work. Below it, students repair valve systems, pipelines and other oil-field installations, and learn how to burn and weld with oxy-arc equipment.



it's only too easy for the inexperienced diver to get confused and inspect the wrong pipe or "fix" the wrong valve. Often, visibility is so poor that the diver must work by "feel."

Gene Aaron—a former master diver in the Navy—recalls one old-timer who covered the face of his mask with tape. "He said he couldn't see anything down below anyway," Aaron explains. "So why in hell should he strain his eyes trying!"

Students learn to use all types of diving gear including scuba, lightweight equipment (wet suits and modern fiberglass helmets), and heavy gear (bronze hard hats and dry suits).

In a rash moment, I said I'd like to suit up in the heavy gear and within minutes I found myself seated on a wire crate while three "tenders" pulled on a rubber and canvas suit, dropped a copper breastplate over my head, fastened a variety of straps, tightened wingnuts on the breastplate, screwed on the helmet, hung a weight belt around my middle and attached weighted straps to each ankle.

With my normal weight of 180 pounds now doubled, it was a strug-

gle (even with the help of my tenders) to get to a standing position. I walked with the grace of Frankenstein's monster.

After making sure that the helmet communications gear was working, that air was indeed flowing into my helmet and that the exhaust valve was functioning, I descended a ladder into a 10-foot-deep training tank. My debut as a hard-hat diver, I am happy to report, was accomplished without incident.

The weight of the heavy-gear outfit has been the stumbling block for the few women who have applied for admission to CDC. "After we've suited up a gal, we say, 'Okay, now get up and walk over to that ladder,'" Jim Joiner explains. "She can't even move."

The average air/mixed-gas class has 30 students; the bell/saturation class, from 12 to 16. The 12-week bell/saturation course is available to the top graduates of the primary course and to experienced commercial and former military divers.

Diving bells are used for most of the deep diving in the offshore oil fields. Norway, one of the nations exploiting North Sea oil deposits, requires bells for operations deeper than 165 feet. The term "saturation" refers to a diver's tissues, which become saturated with an inert gas such as helium after he has spent a certain period in a pressurized oxygen-helium atmosphere.

But before a diver can hope to be taken on for saturation work in, say, the North Sea, he's got to prove that he can do more than blow bubbles underwater. In one of the CDC flyers prepared for distribution to prospective students, there appears this warning:

Diving "is hard manual labor—you don't rattle octopi, and you don't find any chests of treasure—you work!"

★★★

ing is all about. The ability to dive is meaningless if a man can't perform useful work after he's reached the desired depth. Essentially, diving is just a means of transportation to the worksite.

The variety of knowledge and skills the offshore diver must have is reflected in the curriculum, which includes courses in physics and physiology, diesel engines and air compressors, diving techniques, explosives, repair of diving equipment, underwater burning and welding, salvage and rigging, and using the hyperbaric chamber. All these subjects are crammed into the 14-week air/mixed-gas course.

Not only must a capable diver be a rigger, plumber, electrician, mechanic and carpenter; he must also know his way around an offshore oil field. Under a platform, for example,



# PM visits a house full of energy-saving ideas

by John F. Pearson SCIENCE EDITOR

**I**s there a better place for the furnace than the traditional locations—the basement or separate furnace room? Can energy savings be realized from the heat exhausted by an airconditioning unit?

The answer to both questions is yes, as I learned in a recent visit to Homelab, an experimental house located on the grounds of the Westinghouse Research Laboratories near Pittsburgh.

Homelab is used for testing products and systems under conditions approximating those of everyday living, explains Hilary W. Szymanowski, manager of a Westinghouse research group concerned with energy conservation.

"We not only evaluate a product on its own merits, but we also see how it reacts with the overall complexity of a house."

A British-born mechanical engineer, Szymanowski is as enthusiastic about his work as he is dedicated to his pipe. Trailing wisps of smoke, he took me on a tour of the small ranch house.

The heating-cooling module was indeed outside, enclosed in the base of the chimney, which was not the solid structure it appeared but a shell covered with siding material. Two doors that swung up provided access.

"A gas furnace," he explained, "to heat air and coils, a condenser and compressor for cooling." There was also an electrostatic unit for cleaning the air and a small reverse-osmosis device that purified the water before it was delivered to a humidification unit.

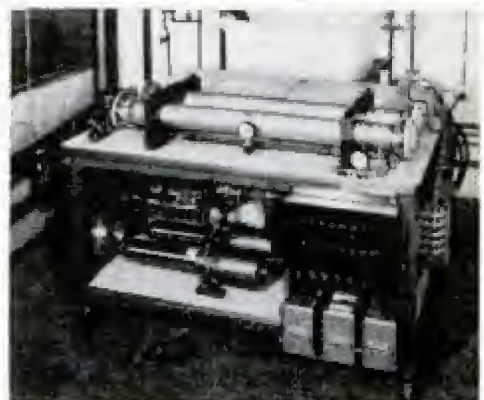
Szymanowski pointed to the hot-water tank and a heat exchanger. "In the summer," he said, "waste heat from the airconditioning system goes into the heat exchanger and heats water before it passes into the tank. We estimate that this system produces seven times the amount of hot water needed by a typical family. It adds up to a saving of about eight kilowatt hours per day."

There are real advantages in having the heating-cooling system outside. It:

■ Frees up valuable space in the

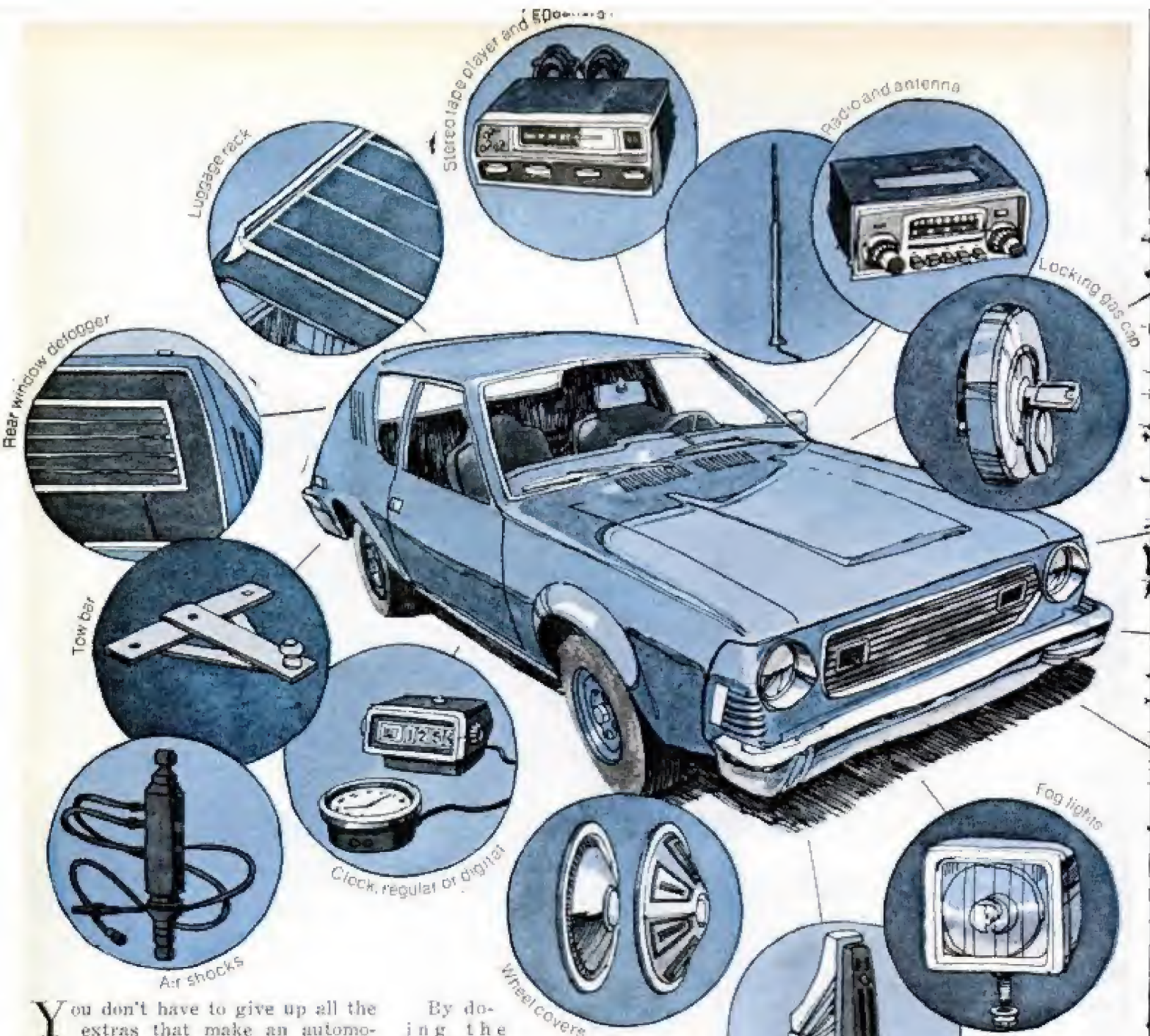
(Please turn to page 101)

Among items under study in Homelab is baseboard (as seen in living room) that conceals electrical wiring, contains power outlets and incorporates intakes and outlets for the heating-cooling system. Hilary Szymanowski (below) demonstrates "give" in ceiling composed of a single sheet of plastic.



Two doors in base of false chimney give access (left) to heating and cooling module. Three separate systems supply water for drinking, washing and sewage. Wash water is recycled by filtering through reverse-osmosis unit (above) and sterilized by ultraviolet radiation. Sewage water is recycled by means of another system, and drinking water is collected from the roof of house.





You don't have to give up all the extras that make an automobile fun or easier to drive to get the price of a car down to something you can afford. If you install the hang-ons yourself, you can have a new car without going in hock to the bank or finance company and still have all the trimmings.

The trick is to start with a stripped car, and add the gadgets and accessories later as you have the money to do so. Some extras you may never want or need, so you save simply by not adding them at all. And, of course, you can save even more if you're willing to forgo some of the bigger luxury items like power steering, power brakes, automatic transmission, airconditioning and so on—it's your choice.

You can save as much as \$1000, depending on how many extras you decide to add. For an outlay of \$3000 to \$3500—cost of the car included—you can end up with an automobile that a dealer would list for \$4000 to \$4500.

By doing the work yourself, you will cut out three middlemen: the factory worker who installs the equipment, the car manufacturer who marks up the worker's labor and the dealer who marks up the price charged by the car company. The auto companies and dealers don't disclose what they make on accessories, but the going rate for a production-line worker is \$6.33 an hour. The car companies and dealers don't pay themselves anything less than that, so if you figure what you're saving in terms of labor time, it amounts to about \$19 an hour—three times \$6.33.

You needn't be a crack mechanic or particularly knowledgeable about cars to install most accessories. Most hang-on hardware can be installed with tools you have around the house. If you need a special-purpose tool, you can rent or borrow it from a friendly guy at the gas station. Some mail-order houses and auto

supply stores catering to do-it-yourselfers loan tools free. If you want to install a muffler, for example, Sears will loan you all the necessary tools for the price of the postage.

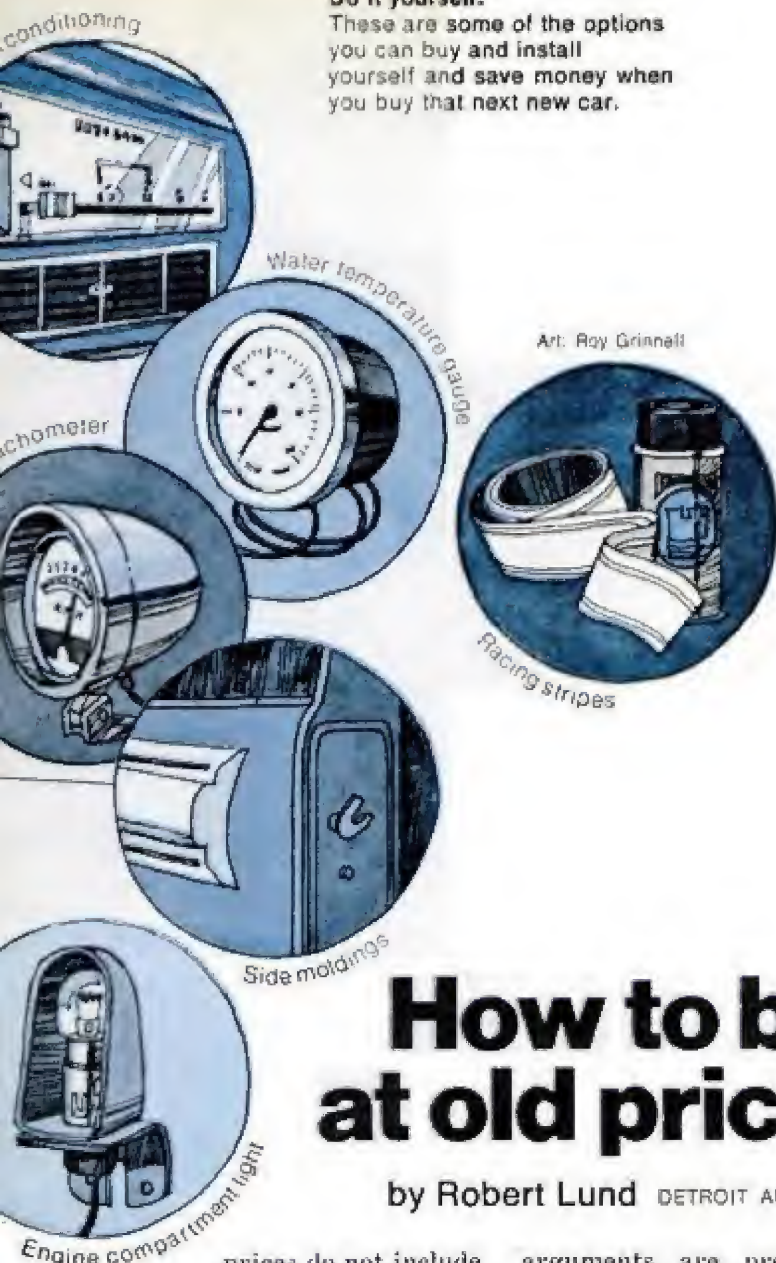
Installation instructions are no problem because all hang-on hardware for automobiles comes with a direction sheet packed in the box or printed on the carton. The do-it-yourself auto accessory business is worth billions of dollars a year to companies supplying the market, so they write easy-to-follow instructions.

The car itself will run you anywhere from \$2700 to \$3200. Lowest-priced American cars are Ford's Pinto at \$2769, Chevrolet's Vega at \$2786, American Motors' Gremlin at \$2798 and Plymouth's Duster at \$3243—all two-door sedans. These



### Do it yourself!

These are some of the options you can buy and install yourself and save money when you buy that next new car.



Art: Roy Grinnell

# How to buy a new car at old prices

by Robert Lund DETROIT AUTO EDITOR

prices do not include freight and local taxes.

You will have to shop around to find the car. Factories don't like to produce stripped models and dealers aren't eager to sell them. Not enough profit. But when you find a dealer with a stripped car or place an order for one, you can probably do better than the full retail prices given above with a little bargaining.

You can go only so far in stripping a car of factory-installed equipment. You can't delete directional signals, outside rear-view mirror and tires, even though you could easily install them yourself. Directional signals and the outside mirror are required by law, and Detroit won't ship a new car without tires. You can spot the "must take" items because they are included in the price of the car. They do not appear on a separate list of options.

Car companies and dealers will tell you that if you want extra equipment on an automobile, you should have it installed at the factory. The

arguments are pretty convincing. The accessory will be mated to your particular car, the job will be done right, the equipment will be covered under the guarantee on the new car and so on. All true—but it's not the way to save money.

On some options, the dealer will tell you it costs no more to have the gear installed at the factory than it would to install it yourself. That's true. What he doesn't tell you is that even though prices of the items may be the same, factory-installed or do-it-yourself, the do-it-yourself item is of superior quality. If the factory price for the add-on is, say, \$20 or \$30, you get a \$20 or \$30 item. If you do it yourself, you still pay \$20 or \$30, but you get an accessory that would be worth \$40 or \$60 at Detroit prices.

**Stripped Gremlin** at the top isn't much to look at, but it costs hundreds of dollars less than the loaded model below it. You can save a bundle of cash by adding many options and accessories yourself.

With the aid of two mechanics, PM has put together two lists of optional equipment. One consists of items you should have installed at the factory, assuming you want them on your car. Don't try to install these items yourself. It's easier or cheaper to have them built in when the car is made. You could install some of the equipment yourself, but it doesn't make sense. Take dual exhausts, for instance. You would have to pull the original pipe out of the car and re-

*(Please turn to page 119)*

**Before**



**After**





**Legendary Fred Bear**, old-time expert, tests the newest of developments, the compound bow. His company now has both tournament and bow hunting models on this year's market.



## Archery today: more strings attached

They've trussed up Robin's trusty long bow, but the bonus is in more bucks and bull's-eyes.

by Ray Gill

Archery today rates as the fastest growing sport—even faster than tennis or ice hockey, and it's changing the fastest, too. Though it scores as only 18th in the money-spent-on-equipment category, it can claim development of more radically new gear in the last few years than any other outdoor activity.

Robin Hood would hardly recognize the way they've trussed up his trusty long bow. Archers, like fishermen, have mourned the passing of their simple stick-and-string equipment. First came laminated bows that gave more strength, bow-life and warp resistance. Aiming sights, aluminum tube and fiberglass arrows, fletching of plastic feathers, and bowstrings of synthetics have all resulted in much higher performance levels for the ancient weapon. Take-down design makes modern bows easier to carry than to wear. And now science has added the mechanical advantage of eccentric wheels to provide extra power when you shoot an arrow through the air. The bow is called a

compound, and while William Tell might not rate the cats-cradle-rigging look as the apple of his eye, traditionalists admire the payoff in more bucks and bull's-eyes.

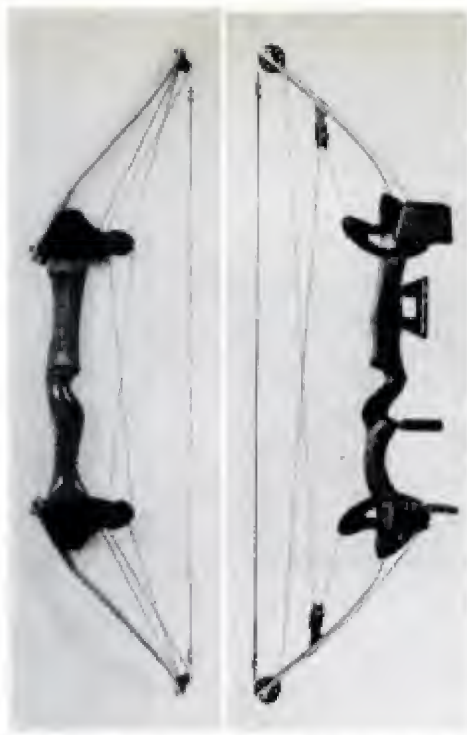
Ever since the original development work and patents by H. W. Allen of Billings, Mo., in the late 1960s, interest has grown in the compounds and several manufacturers now produce them. Some early models had a mechanical-monster look and were assembled from up to 75 assorted wheels, cables and hardware items. Latest compounds, however, have been streamlined back toward the graceful look of the original bow. Weight has been reduced through the use of magnesium for the mid-section casting, and the added power allows lighter arrows. The upper and lower recurve limbs are usually a combination of fiberglass and wood treated with a plastic monomer which is impregnated to add great strength with minimum weight. More speed and power are obtained with less pull and inertia to overcome.



Looking like a cat's-cradle, new bows, like Ben Pearson 250, have extra power.

The secret to the built-in power of the compound lies in stability of the block-and-tackle criss-cross of the cables as well as the leverage added by the offcenter eccentric wheels. The distributed pull of the cables makes it impossible to bend one limb more than the other. The cables' length adds a greater and more sustained foot-pounds-per-inch push than the





variation in cable position puts Herter's eccentrics (left) next to handgrip. Compound Hunter from Carroll's (right) has glass limbs, magnesium handle, sight.

conventional bow. This has been compared to the velocity of a bullet shot from a handgun rather than a rifle of equal caliber using the same bullet weight and powder charge. The rifle, applying the available gas pressure for 20 inches rather than perhaps six inches down the handgun barrel has greater muzzle velocity giving the bullet more speed and greater distance with flatter trajectory of flight.

The offcenter eccentric wheels can be tuned and adjusted for the unique power supplement. The wheels, when their narrowest point is reached, say at full draw, reduce the weight pull and drive the arrow with a smooth compound force-draw curve. The arrow shoots straight, of course; the "compound force-draw curve" refers to the force pattern as it would be charted on a graph. For a conventional bow, the charted curve would show a decrease in force from full-draw to rest. But the compound builds in power from release draw to full power at middle draw, then declines to rest. In addition to greater power, the compound delivers it with less shock and distortion and allows use of lighter arrows.

The take-down feature of the compound makes it easy to pack and carry, it can also be left assembled with less damage due to warping. An ordinary archery glove may be used due to the decrease in pull at full draw, ending the need for hooks and other shooting releases.

Typical of new compounds are Fred Bear's Alaskan Hunting Bow and the Tamerlane II Tournament

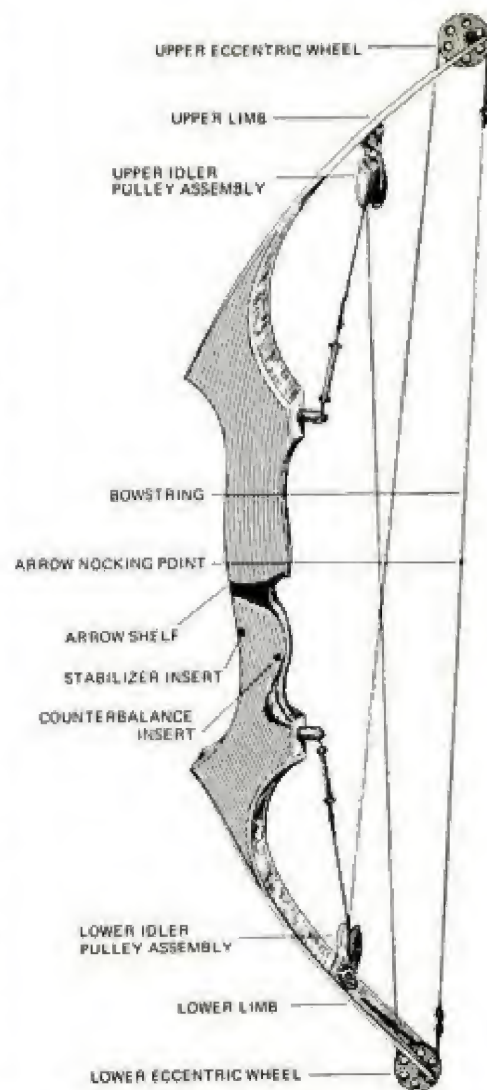
Model, with accessories and features such as micrometer-click adjustment tuning, magnesium handle and glass limbs, eccentric-wheel assembly with dual needle bearings plus timing marks, and recessed low-profile weight adjustment assembly. Both the 3-lb., 10-oz., 50-inch Alaskan and the 4-lb., 4-oz., 56-inch Bear Tamerlane II come apart to fit bow cases slightly larger than an attache case.

From the Ben Pearson Div. of Brunswick, the newly introduced one-piece Model 250 compound has an axle-to-axle bow length of 50 inches and draw weights of 50, 55 and 60 pounds. Browning now offers three compounds, the Hunter and Woodsman, plus the Bushmaster with only a 38½-inch length for ease in stalking through underbrush. Hertzer's has developed and patented its own compound bow, with two added double-sheave wheels that position the eccentrics near the handle. Limbs are adjustable so that tension can be relaxed for storage, and pull is reported to be reduced by 50 percent. Carroll's Archery Products have the C.A.P. 2000 Target model and C.A.P. 1500 Hunter and a "Super H.P." C.A.P. 1200 available in pull weights of 20 to 70 pounds, all for under \$200.

The new compounds are most intriguing, but improvements have been lavished on conventional bows and arrows too. Most archery equipment makers have a full line of bows ranging from beginners' sets in fiberglass to computer-designed center-shot models combining beautifully grained wood with colored fiberglass. Some bows appear attractive enough to purchase and hang up as a decoration. Today's pretty archery shapes, however, have been scientifically designed for maximum balance and power. Mathematicians have computer-checked the designs, and the bulging midsections, contoured hand-grips and recurved limbs provide a build-up of energy not possible in a traditional bow. The "Hyper-Kinetic" limb design for the Ben Pearson line, for example, claims a three-stage build-up of power, storage and release which produces a maximum uniform rectilinear velocity. That's only the limbs; midsections are designed to carry the weight, distribute the power and help eliminate the shock.

Conventional bows are still made of wood alone—from maple, sandlewood, rosewood, and zebra wood, to exotics like benge, freijo, bubinja and imbuya. Because solid wood can be heavy, however, these are often used in laminated combinations with fiberglass and other materials. Less expensive bows are solid fiberglass.

The popular take-down bows use the same designs but offer ease of



New compounds have latest refinements in accessories plus mechanical advantage.

packing and portage plus the opportunity to stick with a favorite hand-grip midsection while changing recurved limbs. This makes possible employing the same hand riser for hunting and target shooting. Special left-handed grips are available.

Though DuPont's polyester Dacron is popular for bow strings, their Kevlar with even less stretch is also being introduced. Compound bows use steel cables with S hooks to which bowstrings are attached.

Arrows, too, have been upgraded—there are over 20 weight choices in aluminum alone. Fiberglass is favored for resistance to moisture and temperature, while cedar is popular still with the novice and traditionalist. Arrow tips range from sharp steel for hunting and blunt tips for birds and small game, on through target and field tips to fishing barbs and harpoons. Accessories grow every year to include more gloves, arm guards, sights, counterweights and stabilizers, clickers, kisser buttons, quivers and cases. Fred Bear's advice seems best: "Don't overbuy at the beginning, but pick quality equipment." ★★★



Copying your color slides at home is:

- ☐ immensely helpful
- ☐ cheap
- ☐ expensive
- ☐ fun
- ☐ exasperating
- ☒ all of the above

Copying slides means more than simply making extras you can send off to friends and family. It also means a second chance at making a good picture from one that didn't quite make it originally. You can enlarge small details to fill your frame (or reduce large transparencies for projection in a smaller format), straighten tilted verticals, and correct errors in color balance and exposure. Your slide copies needn't be slides, either: The same basic techniques will give you color or black-and-white negatives for easy printing.

About the only thing you can't do with current slide duplicating equipment is duplicate a slide exactly. No matter how you try, you'll never get *precisely* the same color and contrast in your duplicate. That's the exasperating part. But the colors can still be good enough—and sometimes they're downright improvements on the originals.

How much slide copying will cost you depends largely on how much of it you do: Whether you make copies in the thousands or just one copy of a favorite slide, you'll have to invest in anywhere from \$19 to \$500 worth of hardware, plus film and processing for test shots to find what filters your setup requires. But once you're past that hurdle, you can duplicate—film and home processing included—for less than a commercial lab would charge—and you get the chance to make corrections and creative changes that only an expensive custom color lab would touch.

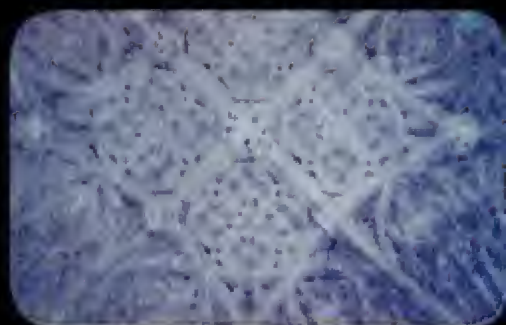
Once you've decided to start slide copying, though, you still have three decisions to make: What kind of film? Which type of illumination? What equipment?

Two decisions—film and light-source—are related. If the color film you copy onto is balanced for the same color of light as your

# Copy your slides at home... and improve them

by Ivan Berger PHOTOGRAPHY EDITOR

Photos by the author



Bringing out detail on dim, shadowy church ceiling involved high-contrast Kodak 2483 film, lengthened exposure.



Four filter packs at once in Zone V mosaic filter let me determine from this one shot what correct filters were. Correct value lay between upper left, upper right packs.





**Retroactive telephoto:** Enlarged copy let me magnify boat in shot made years before I ever owned a telephoto lens.



**Enlarged and corrected:** Crop-mounted slide (see text) now fills frame, green cast is gone.



**Slight green cast** of original has been replaced here by a slight magenta one—not perfect, but a better flesh tone.



**All I had was daylight film**, so I braced my camera against a slanted support to make this yellowish original. Duping with blue filters cured color and tilt.



light-source provides, your filtering problems will be made much easier (but not eliminated). So if you're copying on daylight slide or negative film, electronic flash will be your most manageable choice; if you use Kodak's special duplicating film, Ektachrome 5038, your simplest source is a 3200° K floodlamp. That doesn't mean you *must* use flash for daylight films and floodlights for others—but if you don't, you'll have to use an extra filter.

Both films have advantages. Daylight color is universally available in a wide choice of films, including color negative. And since you may often have daylight color in your camera, you can make a few duplicates whenever you wish, even in the middle of a roll. If you're the type who dashes off the last few shots in a roll just to get the rest of the pictures processed sooner, copying on those normally wasted final frames lets you duplicate your slides for, in effect, nothing. Regular camera film will pep up the contrast of slides that seemed a little flat the first time around.

But most of the time, that contrast buildup between original and copy isn't wanted. That's where Kodak's special duplicating film, Ektachrome 5038, comes in. Its inherent contrast is lower than that of camera films—and if processed as recommended, with reduced first development times, its contrast becomes even lower, though there's still a trace of contrast buildup and some consequent loss of subtle detail. In 100-foot rolls (the only way Kodak sells it), 5038 is about half the price of regular Ektachrome, too.

If you don't want to load your own cartridges, you can buy 36-exposure loads from Spiratone for \$2.70, or 20-exposure loads for \$1.98 from Porter's—still a bit cheaper than regular Ektachrome. But you're better off buying the big roll, loading what you need, and freezing the rest, so all shots will be on one emulsion batch of film for more consistent color. (Orders for several rolls from Spiratone are filled from the same emulsion batch, too.) Even count-





**Slide duplicators vary** in price, complexity. Large units in back row are (left to right): Testrite-Kingdon light box, \$80, which requires separate copy stand or tripod and bellows; Bowens Illumitran, \$495, with variable flash output, built-in meter and bellows; Honeywell Universal Repronar, \$325, shown with optional bellows. Bellows with slide duplicators (second row) include (left to right): Vivitar, \$125; Soligor Multiflex, \$186, with auto diaphragm; compact Novoflex Model 201 with built-in focusing rail (Soligor and Vivitar focusing rails cost \$50 and \$40 respectively). Other attachments include (front row, left to right): Accura Variable Magnification Duplicator, \$19, for use with extension tubes (as shown) or bellows; Spiratone 1X-2.5X Vario-Dupliscopes, \$45 (shown with optional, \$13 strip film holder); Fujica and Rondo movie-film copiers (see below); and Samigon duplicator that fits any camera, \$27.



**Ingenious light boxes:** Testrite-Kingdon (top right) has a built-in 3200° K. floodlight, but can be used with your electronic flash strapped to a window in the box. Bowens Illumitran (right) has built-in light-metering cell (shown over slide here, swung away in group shot, above); it also has variable flash output knob.

Photos: Benn Mitchell

ing the cost of cartridges and a bulk-loader (which you can use with other film), bulk-loading will save you money in the long run.

As to reduced first-development time, most labs won't do it for you—and custom labs that serve professional photographers charge about \$5 per roll; but you can process the film at home for much less—and use the same E-4 chemical kit to process other films, including Ektachrome and Fujichrome.

For those occasional slides a great contrast increase would really improve—especially thin, overexposed

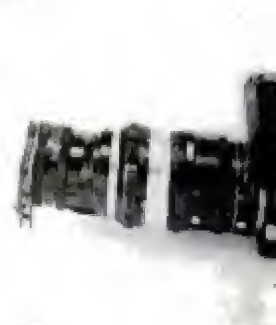
shots, with washed-out colors—Kodak has another hard-to-find film worth knowing about: 2483. Designed originally for microscope photography, 2483 has higher contrast and more saturated, punchier colors.

Your dealer can order 2483. Balanced for daylight or electronic flash,

it takes normal E-4 Ektachrome processing.

Whatever film and illumination you use, you'll almost certainly have to filter your light to get the color you want. Filters usually go between the light source and the slide you're copying (most slide-duplicators have filter slots there), though glass-

**Wide range of light-source** and equipment combinations possible includes: electronic flash (left, below, with Samigon duplicator that fits any camera), which closely matches daylight films; slide projectors (below, center), excellent for use with otherwise dim-viewing copiers like the Spiratone Vario-Dupliscopes shown, but requiring warming filters with 5038 film, cooling filters with daylight film; and floodlight (right, below, with Accura attachment) available to match 5038 or Type A films.





bound and CC gelatin filters can be used over some camera lenses.

These filters compensate for all variables in the color of your light source, response of the film you use, effect of your processing, and color transmission of the slide you're copying from. A typical filter pack will include an ultraviolet filter; color-correction (CC) or color-printing (CP) filters in small to large increments of yellow, magenta and occasionally cyan, red or blue (rarely more than two such colors simultaneously), plus, perhaps, a filter to match the film to the light source.

Because of all the variables we've mentioned, plus the variations between nominally identical filters, you'll have to shoot at least one test roll, perhaps several, to see what combination works for you.

Filter recommendations for various light sources are packed with Kodak 5038 in long rolls and with

the Bowers Illumitran, Honeywell Repronar and Testrite Kingdom duplicators. (If you will send me a stamped, self-addressed envelope, I'll send other filter suggestions.) But because of variables mentioned, plus the variations between nominally identical filters, you'll have to shoot at least one test roll, and probably two or more, to find the filter pack that works best for you. Zone V, Inc., Box 811, Brookline, Mass. 02147, has a set of four-value filters for \$8 that shortens the testing somewhat, but you'll still need other filters to shoot with. When you test, keep careful records of filters and exposures used for each shot—especially important with 5038, which has no frame numbers.

All the equipment you need to copy slides is a slide holder, a way of focusing your camera down to cover just the slide (or less, to blow up portions of the slide), a light that's



Photo: Charles Smith

**Your enlarger**, especially if it has a color head, can make a dandy slide copier, holding your camera at a convenient height. Fasten the camera *securely* below the enlarger lens, adjust its distance with extension tubes, and view through a periscope-type finder as shown above.

evenly diffused across the slide, and a filter holder between the slide and the light. In a pinch, you can get away with extension tubes, daylight film, and a slide taped to a window pane on a bright sunny day.

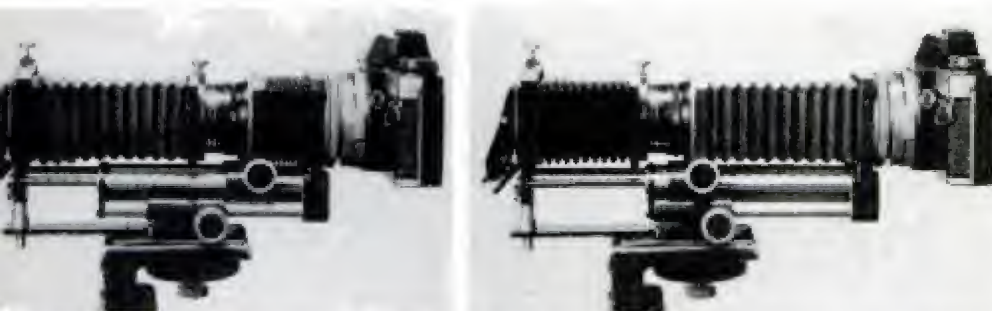
But slide-copying attachments incorporating all but the light source aren't too expensive. The cheapest type holds slide, diffuser and filters in front of your lens, with extension tubes or bellows needed to focus the lens down to the slide's distance, such as the \$19 Accura shown here. (We're not counting cost of tubes or bellows—you may already have them for close-up work.) Such copiers aren't too sharp, as even the best camera lenses aren't too good for extreme close-ups of flat objects (macro lenses are better); and you can only use these copiers with cameras whose lenses can be interchanged.

For fixed-lens cameras, you can get similar devices (like the \$27 Samigon shown) that focus the lens down with a close-up lens—making sharpness even more of a problem.

Similar to the first type are attachments that mount on your bellows (if you have one). These let you vary your magnification over a wide range. Many bellows let you either reverse your camera lens to increase sharpness or, better yet, use an enlarging lens instead (enlarging lenses are superb for flat close-up work). Each make of bellows has its own attachment; prices are around \$40 to \$80.

Duplicators, like the Spiratone Vario-Dupliscopes, attach in place of your lens, as they have their own lenses built in. Since same-size Dupliscopes cost around \$20 to \$25, and "zoom" types that enlarge up to 2 or 2½ times cost around \$40 to \$65, the built-in lenses can't be expensive; but since it's a very slow lens built

(Please turn to page 108)



**Bellows copiers** give you flexible control of copy size; magnification range widens if you change focal lengths. Second bellows between slide (left) and lens keeps stray light reflections off slide. Novoflex outfit shown was especially easy to use.



**You can copy projected images** as shown, though sharpness suffers slightly. Use a longish (85 to 100-mm) camera lens, with camera as close as possible to projection beam, but not touching projector. Light beam is a bit blue for use with indoor films, a bit red for daylight types.



**Home movie frames** can be copied as slides or negatives with Fujica copier (far left) or Rondo (left). Fuji unit copies Super-8 or 16 mm, fits Pentax-thread reflexes (including Fujicas); Rondo fits all SLRs with "T" adapter.



No boat is as much fun, as inexpensive, as easy to use in a variety of ways—and as dangerous—as a little one. Properly selected, prepared and handled, small craft have been rowed, paddled and sailed across oceans (though their skippers were also lucky to survive). But for what they were designed to do on sheltered waters, they can't be beat. From the hundreds of types available today, here's what you need to know to pick the one that's right for you.

You may be selecting a dinghy, pram, canoe or kayak, skiff or johnboat, dory, inflatable, foldboat, car-topper, punt, duckboat, sneakbox, raft, sailboard or guideboat, just to name a few. Sometimes the same design will have a different title depending on how it's used, or where. You won't need to learn all the names to make your choice from among the new models now available, but there are other important questions you'll need to answer.

First, decide how the boat will be used, and where and by whom. Figure what you can afford to spend. One big appeal of a small craft is its lower cost. But if you can't do with it what you like, then it's not a bargain. You may need something larger if you want a load of friends to anchor out with you for the weekend.

So let's agree our small boats will be 12 feet long or less. A good one of this size will cost from several hundred to several thousand dollars. This is more than you'd hoped to spend for "just a little boat"? Well, we'll look at what you should get for this money, and then some tips that allow you to spend considerably less.

### Bargains that aren't

At a shop at almost any beach, you can buy for \$10 "little boats" of brittle plastic or inflatable vinyl that

Assorted aluminum models (below) are selections for Montreal's 1976 Olympics.



Camping can even be managed with Sunfish. Crew (right) stows gear on foredeck.

are toys, but dangerous ones offshore. Fine for a small swimming pool and youngsters who are good swimmers. But in open water, they can drift kids far out into deep water and a lot of trouble. Some beaches and lifeguards do not allow them for this reason. Usually they can break, capsize or puncture and deflate easily. When the children beg for a little boat of their own, something more durable (though more expensive) with built-in flotation is much the better buy.

One step up from toys are the still inexpensive inflatable liferafts and kayaks that usually sell for under \$100. Because of their flat bottoms and lack of keel, these doughnut and oval-shaped rafts are difficult to paddle or row in a straight line and tend

to drift sideways or backward in a breeze. They can be useful for backpackers and fishermen, but often the flotation tubes will chafe and puncture easily on floating branches and sharp rocks. Many are not big or strong enough to mount a little outboard motor, and the Coast Guard tends to rank them as toys as well.

The sober fact about "rubber" boats is that good ones cost as much or more than rigid ones. A quality inflatable is made of long-wearing fabric, provides great flotation and carrying capacity, stores compactly, does not get damaged when banged into a dock or scar the topsides of a yacht when used as a tender. Its low center of gravity makes it stable and the low sides are an advantage for swimmers and skin divers. But being inexpensive is not one of its advantages when it is built to last, and pumping it up can be tiresome if you have to deflate it after every frequent use.

Particularly no bargains are the old wooden rowboats you can find in waterlogged condition along some waterfronts. Dry rot, a destructive wood fungus disease, may have set in and sections will require extensive rebuilding. In addition, they tend to leak and soak up water for a tremendous gain in weight. Tied up at your dock for the season, an old planked rowboat may be fine. But for constant launching and hauling out, it can be a backbreaker that will sell you quickly on the advantages of the new aluminum, fiberglass and ABS models.

### Used how, where, by whom

Ideally, you want to pick the right boat for your requirements, made of the best modern materials, that gives you the most for your money. There is no such thing as an all-purpose boat, but a little one is capable of

## Big bargains in little boats

Select the right small one and you can row and paddle, power and sail, fish, cruise and camp all with a model light enough to cartop home.

by Vic Harris



Cruising through Connecticut River chop, Sunfish sail out (left) for overnighting.



Rowing is still standard power for small craft like Sportyak dinghy shown below.







Flotation foamed between cockpit and hull is feature of Boston Whaler and others.



Catamaran design of Catyak (right) gives added stability and deck for small sailer.

doing a wide variety of assignments.

How will you use it? Fishing? Day sailing? Gunkhole exploring upstream through the shallows? Water-skiing? Camping? White-water runs? Afternoon cruising? Sail regattas in summer and frost-bite racing in winter? Ferry service out to a larger boat anchored offshore or at a mooring? Will it be rowed, paddled, powered or sailed? There are small craft suited to all these chores.

And what are the water conditions where it will be used? One good clue to the best choice is a careful look at successful small boats in your area. If experienced local boatmen seem to prefer a Boston Whaler or Chris-Craft dinghy, a Bonair or Zodiac inflatable to handle the short chop in a harbor, a Grumman or Old Town canoe for their wilderness trips—whatever it is, what's being used in your area will be worth considering. Do nearby boat livery outfits offer Alumacraft or Lund, Starcraft or Ouachita aluminum skiffs for day rental to fishermen, fiberglass Sunfish or Hobie 10 sailboats for beginner practice? Chances are these have been found to stand considerable abuse with minimum maintenance.

If, however, you need an extra-light hull that you can single-hand into the back of a station wagon or up onto a car roof, you may be willing to sacrifice some rugged strength in exchange for a little less poundage. But, again, note the flyweights that are successful on the waters you want to use. The ride is likely to be a little more seakindly. Selling or trading in a locally popular model is also easier should you decide you want to trade up or down.

In a small boat you learn quickly

that "water" is not just water, and that an open bay on Lake Mead or Lake Huron, or off Maine, California or Louisiana is not the same. Size can add up to more safety. The car-topper that is big enough for the pond at the summer cottage is not likely to be the right choice for the Great Lakes. Decide in advance where most of your boating will be done. Take your little boat along if it will be suitable, but leave it home and rent the right boat on the spot if there's a chance you will run into rougher water. Small boats take extra skills and qualifications when the weather changes.

The question: "Who else will be using your little boat?" is usually answered: "Children and non-boatmen." It's no secret that more people drown while using small boats than any other kind. Generous flotation becomes particularly important in that boat you buy when there's a good chance that kid-horseplay may swamp your pram, a fisherman reaching out with his dip net can flip the canoe, a duck hunter standing up for a crossing shot can rock the boat and fall overboard.

Your small hull must be able to stay afloat with all passengers holding on, even when filled with water. It should have a plaque stating the maximum weight of passengers and gear it can carry, plus the most horsepower it should handle. Small boats almost always use an outboard motor with tiller steering because cockpit room and balance do not allow a steering wheel forward. But

Even inflatables, with rigid transoms and enough power clamped on, can tow skiers.



Fishing is still the favorite activity on the water for skiffs and all smaller boats.

with a tiller, abrupt motions can be made so quickly that even a low-powered motor can capsize a little boat, or tip it enough so that water sloshes over the side and swamps it.

To figure the safe load for a small craft of normal shape, being used in calm seas with mild winds, you can make a passenger estimate with this formula: Multiply the overall length times the maximum width, divide by 15 and the result equals the number of people for a safe load.

A 10-foot-long dinghy with a 3-foot beam, for example, could carry you and one passenger. But carefully. If one of you is carrying big duffel bags or a 50-pound block of ice and steps on the gunnel, you're still likely to get in trouble. The formula obviously doesn't work with canoes or sailboards, among others, and doesn't tell you if your boat has enough freeboard (that essential height of the side above the waterline) to keep the waves out when the going gets rough. When in doubt, be conservative when you add up capacity. Remember, too, that a hull big enough to take a friend along is much safer; survival chances go down when you are out alone and fall overboard.

### Building materials

Like big boats, small ones can be well made today of fiberglass, aluminum, ABS plastic and wood. Like large custom-built yachts, little ones can still be beautifully crafted in wood. They will require more maintenance and tender loving care, but a canvas-covered canoe, wooden guide boat, miniature mahogany or plywood runabout can be a pleasure to own.

Fiberglass and aluminum boats are

(Please turn to page 110)



# IT'S NEW NOW

## Mini camper for pickups

This mini camper for pickups fits snugly behind the truck cab, leaving room for hauling cargo or a larger fifth-wheel trailer. Called Kid-Napper, it provides extra seating space for four children or two adults and converts to sleeping quarters. It has its own door, but can also be entered directly from cab. Available in several sizes and styles depending on needs. For additional information, write Finch Camper Sales, Highway 385 South, Alliance, Neb. 69301.



## Quick, one-step finishes

Stain 'n Buff is an easy, one-step, no-mess finish in paste form you just wipe on for rich, lustrous effects in any of six wood tones. A similar paste finish, Rub 'n Buff, comes in 18 colors. Made by American Art Clay Co., ½-ounce tubes are sold at paint and craft stores.



## One-piece spiral staircase for easy installation

Designed especially for a do-it-yourself installation, this modern spiral staircase comes preassembled as a single unit. You just set it up, plumb the central column and anchor it in place with five bolts. The steel stairway, finished in satin black, has no visible welds. It's available in any height and with the steps turning either to left or right. Standard Model 44-9 for typical home is \$378. American Ornamental Metal Co. of Austin, Inc., 5013 North Loop Freeway East, Houston, Tex. 77026.



## Intercom-phone pages, plays music

Versatile intercom-telephone lets you talk to anyone in the house, play music, hold group conversations and page others quietly without having to shout. Speakeasy system consists of a central control station and four extension phones. Hooked into your phone line, it handles both outside calls and internal calls. About \$900. North American Telephone Corp., Box 241, Point Clear, Ala. 36564. (Not intended for homeowner installation.)



## THE LATEST PRODUCTS AND DEVELOPMENTS



### Small shower with a big look

Smartly styled curved corner shower shown above and at left saves space in a small bathroom, yet has a large, elegant look. The one-piece molded fiberglass enclosure has a radius of only 38 inches, comes ready to install in a choice of several color combinations. Its accordion-fold door slides from either side and latches in both open and closed positions. Price of Showerfold is about \$396. Kinkead Industries, United States Gypsum Co., 101 South Wacker Drive, Chicago, Ill. 60606.

### Thiefproof lock for outboards

Easy-to-steal outboard motors can be made theftproof with this locking bar that slips over the clamp-screw handles, preventing an engine from being removed. It stops accidental loosening of clamps through vibration and serves as carrying handle. Fits most outboards with clamp mounts. \$10.95, Master Lock Co., 2600 North 32nd St., Milwaukee, Wis. 53210.



### 'People phones'—something to talk about!

Artist Bob Ebers thinks the standard telephone is too sterile-looking and lifeless. So he's created a series of "People Phones"—humorous characterizations made of plywood and odds and ends of hardware. The figures—in about a dozen types—all incorporate actual working phones. They've attracted so much attention they're now selling for \$150 to \$300 from Bob Ebers, 35 West 20th St., New York, N.Y. 10011.



### Hones speed sharpening

It looks more like a rabbit-ear TV antenna, but it's really a hone for sharpening knives. Two ceramic honing sticks are set in a base at proper sharpening angle. You run the knife blade alternately along the twin hones to produce a razor-sharp edge. Sticks slip out of base for easy storage. \$9.80 post-paid, Indian Mountain Whetstones, Box 276, Hot Springs, Ark. 71901.



### New waterborne 'motorcycle'

It's a Kawasaki, but you wouldn't recognize it without its wheels. A sort of cross between a waterborne motorcycle and self-powered surfboard, the sport craft skims along at speeds up to 35 mph. Called Jet Ski, it's powered by a 26-hp engine with jet drive and has a unique safety feature: If you take a spill, it automatically rights itself, slows down and circles back so you can remount. Price not yet announced. Kawasaki Motors, 1062 McGraw Ave., Santa Ana, Calif. 92705.



# NOW



## Tape splicers get fancy

Those simple splicing blocks professional tape editors use are now available with extras such as built-in cutters, splicing-tape holders, and more. Nagy Research, Box 289, McLean, Va. 22101, has cassette and 1/4-inch tape models from \$17 to \$50; model shown, \$26.50 postpaid.

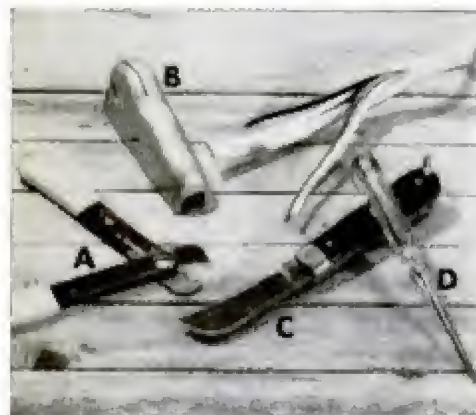
## Kit-built boat trailer

This lightweight boat trailer comes as a kit, can be assembled or disassembled in minutes. It holds 250 pounds, carries small fishing and sailboats up to 14 feet long. Knocked down, it can be stowed in a closet—handy for those who lack storage for a conventional trailer. \$215, including prepaid shipping to anywhere in continental United States. Trailex, Inc., 60 Industrial Park Dr., Canfield, Ohio 44406.



## Quartet of electrician's tools

For electrical work: A. Spring-loaded wire stripper cuts solid and stranded wire from 10 to 24 gauge; \$1.99 list. B. Captain Hook cable ripper allows continuous ripping of Romex; \$3.19. C. Tradesman Knife has wire-stripper, screwdriver blades, safety lock; \$3.59. D. Screwdriver tester handles 80 to 330 v.; \$1.39. Ric-Nor Co., Inc., Box 164, Somerville, Mass. 02143.



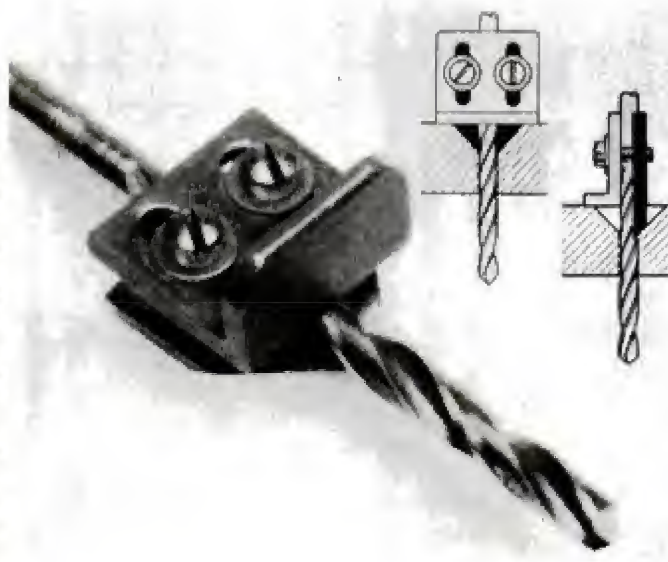
## Drive-in clamps for gluing up

Pinch dogs driven into end grain draw boards together tightly for gluing up table or bench tops, can be used again and again. Size shown, 1 in., sells for \$8.60 per dozen postpaid. Other sizes available: 1 1/2 in., \$9.90; 2 in., \$10.60; 3 in., \$12.50; lightweight pinch dogs, 1/2-in. size, \$1.20 per dozen. Woodcraft Supply Corp., 313 Montvale Ave., Woburn, Mass. 01801.



## Adjustable countersink holder for drill bits

One-operation drilling of countersunk screw holes with standard twist drill bits is made possible by countersink holder that also acts as a depth stop. Slot in holder fits bits from 1/16 to 3/8 in. dia.; stop slides to position for desired countersink depth; setscrews hold assembly firmly. \$3.75 retail, in hardware stores, or from manufacturer (plus 50 cents postage), Connecticut Valley Manufacturing Co., 265 Newington Ave., New Britain, Conn. 06051.



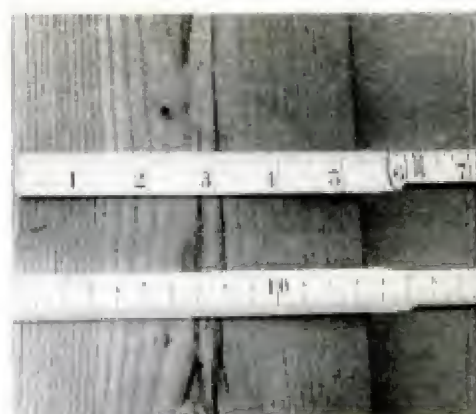
## Bouncy, burnout-proof meter

Drop this volt-ohm-milliammeter and it not only keeps working but lets you check how accurately it still works and readjust it. Fuses prevent burnouts. Probes have recessed connections at meter end to prevent shocks, insulation-piercing needle tips with removable alligator clips at the other. Modular for easy repair. Triplett Model 60 is \$90. Triplett, Bluffton, Ohio 45817.



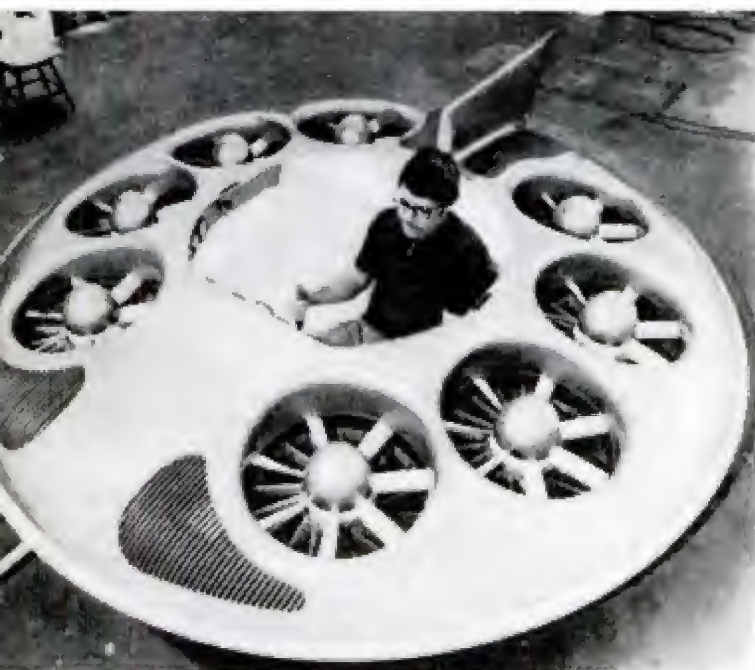
## Frameless picture-hangers

You don't have to frame your photos to display them. Just mat or mount them on stiff board and slip them into Falcon Photo Gallery Wall Brackets; you can change pictures any time. Brackets are \$3.50 per pair at photo stores, in black or white. They stick or screw to walls.



## English-metric folding rule

For working in either English or metric measurements or for quick conversion of one system to the other, Lufkin offers a 6-foot folding rule with inches and sixteenths on one side, centimeters and millimeters on the other. You just flip it over to read either equivalent. \$3.80, Lufkin Rules, Box 728, Apex, N.C. 27502.



## A 'flying saucer' that may really fly

Small planes of the future may look like this saucer-shaped craft designed by Paul Moller of Davis, Calif. Powered by eight 24-hp Wankel-type rotary engines turning props in the rim, the two-seater VTOL Discojet is expected to cruise at 165 mph, is gyroscopically stabilized, can be flown by a single control stick and throttle. Its low cost and simplicity of design are said to make it ideal for sport pilots. Estimated price: \$10,000.

## Sparkplug socket set

For use on cars, boats and small engines, chrome-plated, sparkplug socket set includes flex-head ratchet with 180° swing, 13/16 and 3/4-inch sockets with oil-resistant Neoprene inserts, 1 1/4 and 3-inch extensions for reaching in tight spots. About \$12; Bernzomatic Corp., 740 Driving Park Ave., Rochester, N.Y. 14613.



## More beer, less foam

Beer drinkers don't like a big head of foam when they're paying for a full measure of brew. But when you drink from a mug, you can't see what you're getting. This bothered German inventor Ernst Binder of Pfaffenhofen near Munich who, like most of his countrymen, prefers a mug to a glass and doesn't like foam either. So he devised this mug with a built-in sight glass to show the true level of liquid. It also tells when you're running low.



## Mobile medic: Have hospital, will travel

Most doctors don't make house calls any more, but this one not only visits patients at home but brings a whole mini hospital along with him. The mobile medical van was outfitted by Dr. James W. Turpin and his wife Mollie, also a doctor, of Clarkrange, Tenn. It contains an examining table, emergency heart and respiratory equipment, full stock of medicines and facilities for minor surgery, setting fractures and treating wounds. A similar unit for on-the-road dental work is also in use.



## A World War I Camel comes to life—the hard way

Restoration experts at the Air Force Museum near Dayton, Ohio, were shocked when they learned they were to produce a genuine World War I Sopwith Camel, famed British fighter flown by American pilots. The craftsmen were accustomed to restoring relics, but all known original Camels were in other museums or privately owned. So they had to start from scratch. Working from authentic plans, they recreated every rib, spar and rivet exactly. A few parts, like the French Clerget rotary engine and twin Vickers machine guns, are originals. Construction time: about 10 years. While the ship is operational, there are no plans to fly it: "Too great a risk of loss after so much hard work," say officials.



## Slimming mirror

If appearing to look thinner makes you feel better psychologically, you can get your wish with this trick mirror made of flexible plastic. Turning knobs at edges changes its curvature to make your image as slim as you want. Not just for laughs, it's designed to show dieters what they could look like if they really try. Price isn't for laughs, either: \$695 from Hammacher Schlemmer, 147 East 57th St., New York, N.Y. 10022.



## Deluxe tire gauge

This dial-type tire pressure gauge has several features that make it handy for taking accurate pressure readings. The gauge has a range of 0 to 60 pounds with a stop-action pointer that holds the indicated reading for as long as you want. There's also a bleeder valve that lets you release excess air until exact desired pressure is reached. \$9.95 ppd., Dick Cepek, Inc., 9201 California Ave., South Gate, Calif. 90280.



## New Polaroid takes six film sizes

Super-Shooter takes both small 3¼ by 3¾-inch and bigger 3¼ by 4¼-inch Polaroids, depending on which size film pack you load; its viewfinder adapts automatically to match film in use. That gives you a choice of six film types: small, economical Type 87 black-and-white (fast, but with good image tone); Type 88 color; larger Polacolor 108 (Type 1 and the more colorful, but more expensive Type 2); 3000-speed 107 black-and-white; and 105 black-and-white that gives you a negative as well as an instant print (*New From Polaroid*, page 142, May '74). It has electric-eye shutter, adjustable focus, built-in flashcube holder that rotates—all for \$25.



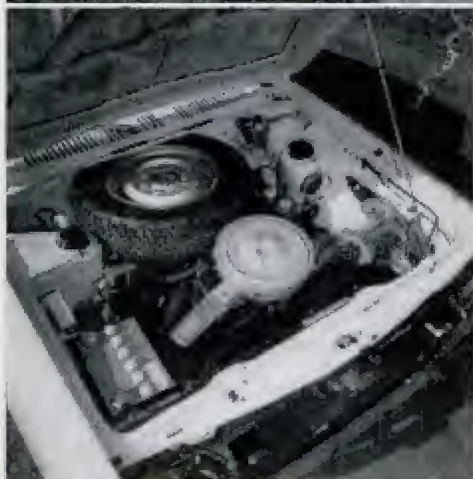
## Pocket-sized illuminated magnifier

Convenient for modelmaking, reading fine print and other close work, Magna-Lite pocket flashlight magnifier weighs 1½ ounces and measures 1½ by 5 inches. Laid flat, as above, lens is automatically at correct height for reading print or studying small photo contacts. \$6.20, complete with two AAA batteries and bulb. Thomas Specialties, 1409 West 77th St., Darien, Ill. 60559.



# Driving Subaru's 4wd station wagon

by Michael Lamm  
WEST COAST EDITOR



Four-wheel drive Subaru station wagon is a one-of-a-kind. Other Subaru models are front-wheel drive, and all use a horizontally opposed four-cylinder, water-cooled engine. Stowage of spare tire in engine compartment adds to luggage space.

Subaru has taken its conventional front-wheel-drive station wagon and converted it to four-wheel drive (4wd). How? By simply planting a power takeoff on the back of the four-speed transmission and running a driveshaft to a deDion differential at the rear. Why? For use in snow, on ice, in the wet, and in the rough.

Does it work? It surely does, and better than many other 4wd setups I've driven. A simple in/out lever on the floor ahead of the stick shift makes going into and out of 4wd a snap. And 4wd may be engaged or disengaged at any speed below 50 mph. Subaru recommends driving under 50 in 4wd anyway.

Hard cornering in 4wd, on smooth pavement and in a plowed field, felt the same to me as in fwd (front-wheel-drive) only. I suspect, though, that on any icy or wet road, you'd notice a difference in traction and cornering power. Of course, fwd alone is more stable, generally, than conventional rear drive.

The only thing you have to get used to in 4wd is a slight braking force at low speeds in tight turns, such as parking. This comes because of different gear speeds between the front and rear axles with one set of wheels cocked. Otherwise, though, steering is remarkably light.

The 4wd Subaru wagon negotiates

*(Please turn to page 103)*

## Specifications—Subaru 4wd

Engine type: Horizontally opposed Four, water-cooled, four-stroke  
Bore, stroke (in./mm): 3.35x2.36/85x60  
Displacement (cu. in./cc): 83/1361  
Compression ratio: 9.0:1  
Transmission: Four-speed manual, floor lever  
Ratios: 1st, 4.091:1  
2nd, 2.312:1  
3rd, 1.464:1  
4th, 1.029:1  
Reverse, 4.100:1

Differential ratio: 4.125:1  
Wheelbase (in.): 96.1  
Overall length (in.): 158.7  
Overall width (in.): 59.1  
Overall height (in.): 57.5  
Ground clearance (in.): 6.3  
Steering type: Rack and pinion  
Steering ratio: 19.2:1  
Tires: 155 SR-13 tubeless

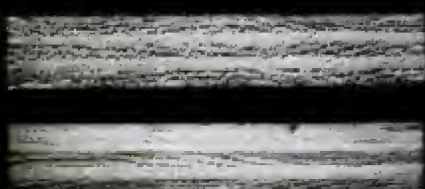


# Deburring jig makes saw cut smoother

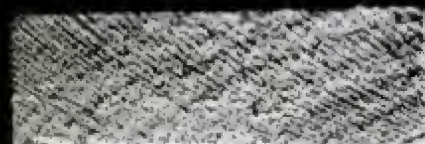
Removing a burr makes for butter-smooth saw cuts—the differences (left) are amazing.

by E. A. Franks

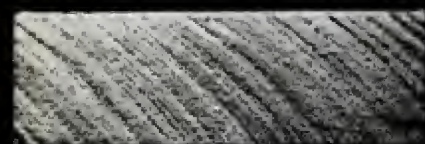
Photos: John Capotosto



3/4-IN. PLYWOOD



3/4-IN. PINE CROSSCUT



3/4-IN. CHERRY CROSSCUT

You're probably not getting the smooth cuts you should from your circular-saw blades. Even a blade that has just been ground or filed properly has a residual burr that chews up edges and leaves a rough-cut surface. This burr can be eliminated with a jig like the one I made to give my saw blades a final dressing. Dimensions must suit the saw-blade diameter you use.

Blades must be absolutely free of gum and pitch before deburring. The stones are not oiled. The jig is intended for use only with blades that have no set (those with a set do not require deburring); I have found it produces excellent results with plywood blades and combination blades.

It's essential to use a regular (commercial) saw arbor, which must be mounted so that it is at exactly 90° to the stone-carrying slide, in both horizontal and vertical planes. The arbor is secured with a blunt-tipped Phillips-head screw, turned just snug, as a setscrew; the cap atop the post hides the screwhead. A suitable handle is attached to the rear of the arbor.

Bevel natural stones to allow easy insertion of blades between them. I particularly like the stones supplied by Hindostan Whetstone Co., Bedford, Ind. 47421. Use glue sparingly when attaching the stones. Allow complete drying between gluing operations to keep foam spongy. ★★





**Chisel tool** separates foam-sprung stones for insertion of the saw blade, is kept in the spool at the rear of the jig.



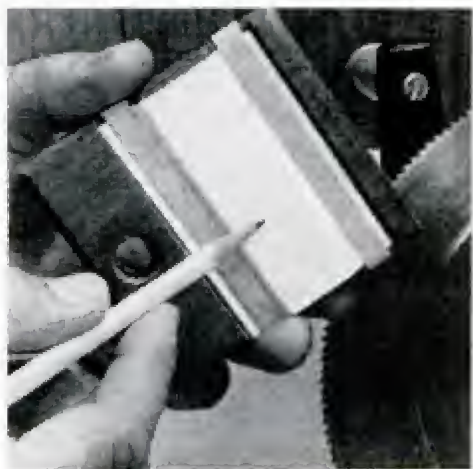
**Slide is pinned into position** with blade between stones. Pin is mounted in cutoff thread spool attached with cord keeper.



**Blade gets five or six turns** between soft stones first, in direction counter to that in which it normally cuts.



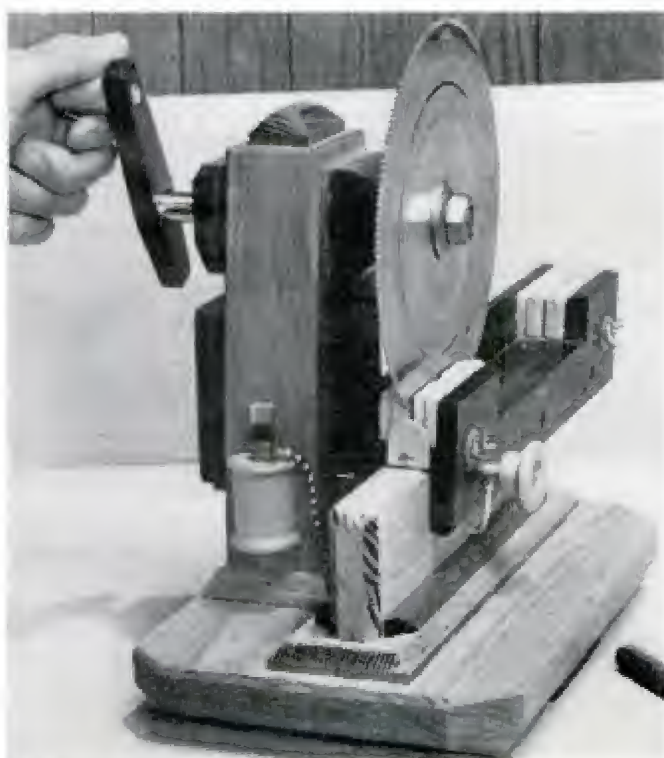
**After another half-dozen turns** between hard stones, blade is turned against paper on block to test for smoothness.



**Cutting or scratches** on paper surface indicate that deburring is incomplete and that the process must be repeated.



**Stones measure  $\frac{3}{8} \times \frac{7}{8} \times 3$  in.**, are lightly glued to  $\frac{3}{8}$ -in. polyurethane foam blocks lightly glued, in turn, to slide.



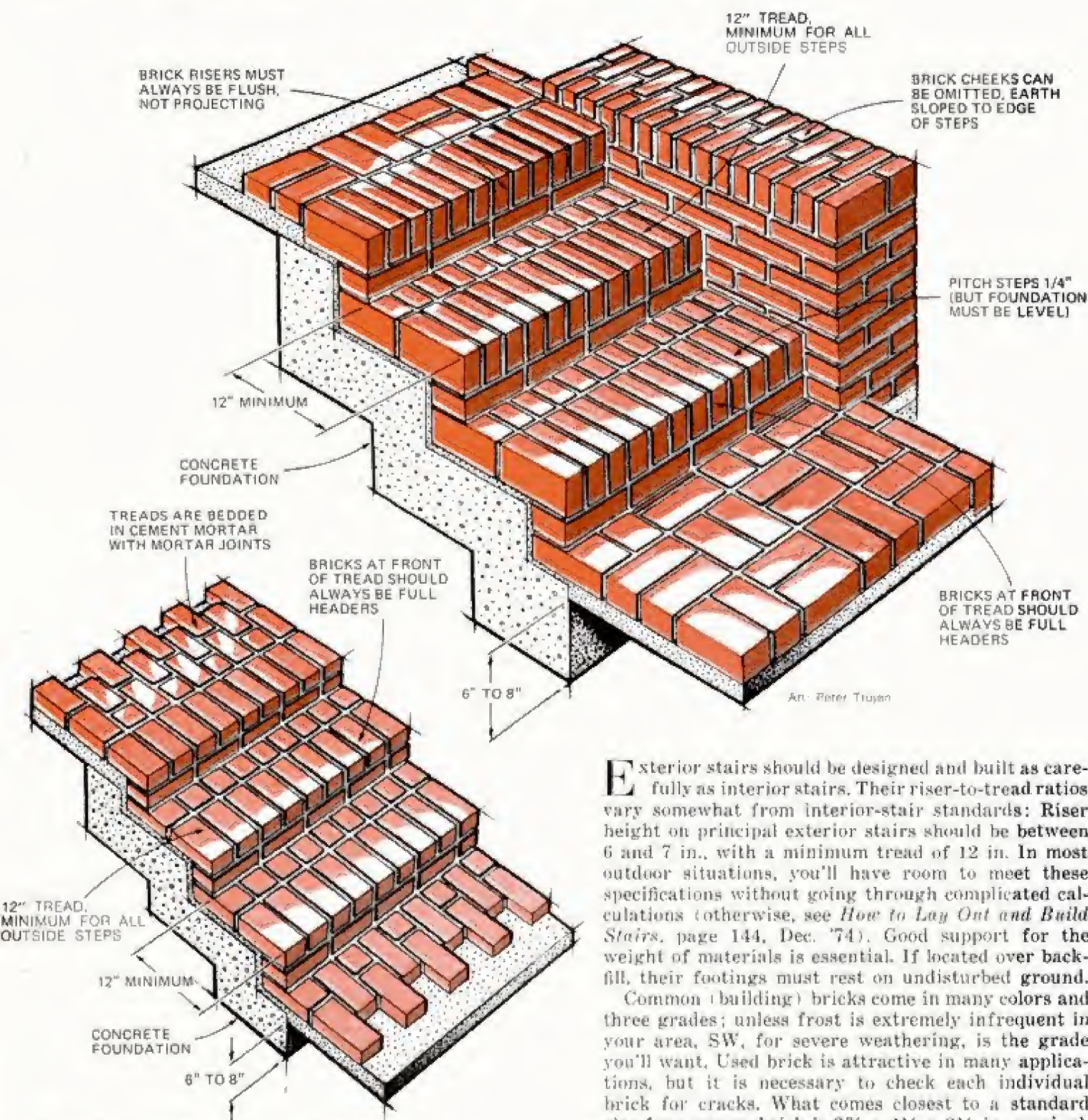
**Hard stones grip blade** for second stage of deburring. Three-quarter view shows fitting of slide to rail and spool holder for stone-opening chisel tool.



**Wingnuts fasten rear face** of slide in place, allowing it to be removed when stones must be replaced. Front face is attached to the center piece with three Phillips-head screws.



# How to build brick and masonry steps



## Planning, estimating and foundations

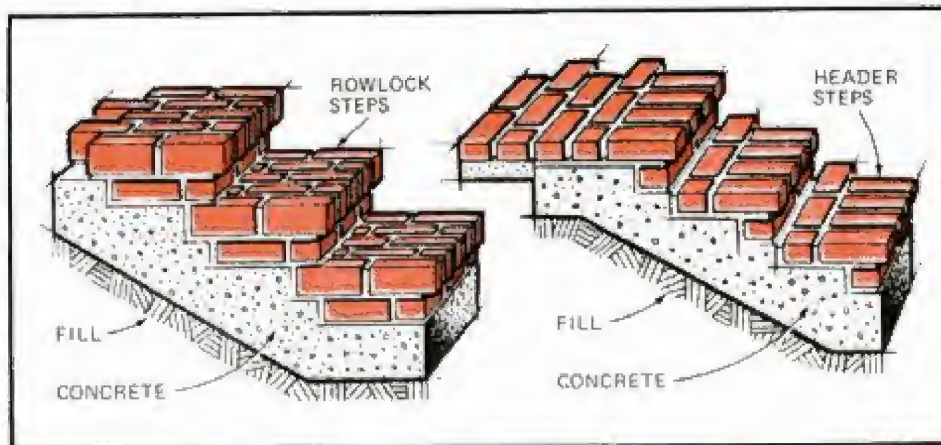
First of all, especially if steps are to be a permanent part of your home, check your municipality's building department on local code requirements. It may stipulate, for instance, that steps must be tied to house foundation. Since steps are more complex than walls, it's best to make scale sketches so you can count the number of bricks needed—then add 5 percent for waste to your order. Foundations (footings) shown above and at the top of the next page are probably best left to professionals to pour, but you can make them yourself if you're willing to handle the complicated formwork involved.

Exterior stairs should be designed and built as carefully as interior stairs. Their riser-to-tread ratios vary somewhat from interior-stair standards: Riser height on principal exterior stairs should be between 6 and 7 in., with a minimum tread of 12 in. In most outdoor situations, you'll have room to meet these specifications without going through complicated calculations (otherwise, see *How to Lay Out and Build Stairs*, page 144, Dec. '74). Good support for the weight of materials is essential. If located over backfill, their footings must rest on undisturbed ground.

Common (building) bricks come in many colors and three grades; unless frost is extremely infrequent in your area, SW, for severe weathering, is the grade you'll want. Used brick is attractive in many applications, but it is necessary to check each individual brick for cracks. What comes closest to a standard size for common brick is  $2\frac{3}{4} \times 4\frac{1}{2} \times 8\frac{1}{2}$  in. nominal. Actual size is  $\frac{1}{2}$  in. smaller in each dimension—the space taken up by  $\frac{1}{2}$ -in. mortar joints between bricks. By using the nominal size in estimating the number of bricks needed, you get an automatic allowance for joint space—but check on the sizes stocked locally before estimating.

The space between your finished steps and house foundation must be sealed. This is done by filling the joint with oakum (a fibrous material), then applying tar or mortar caulk.

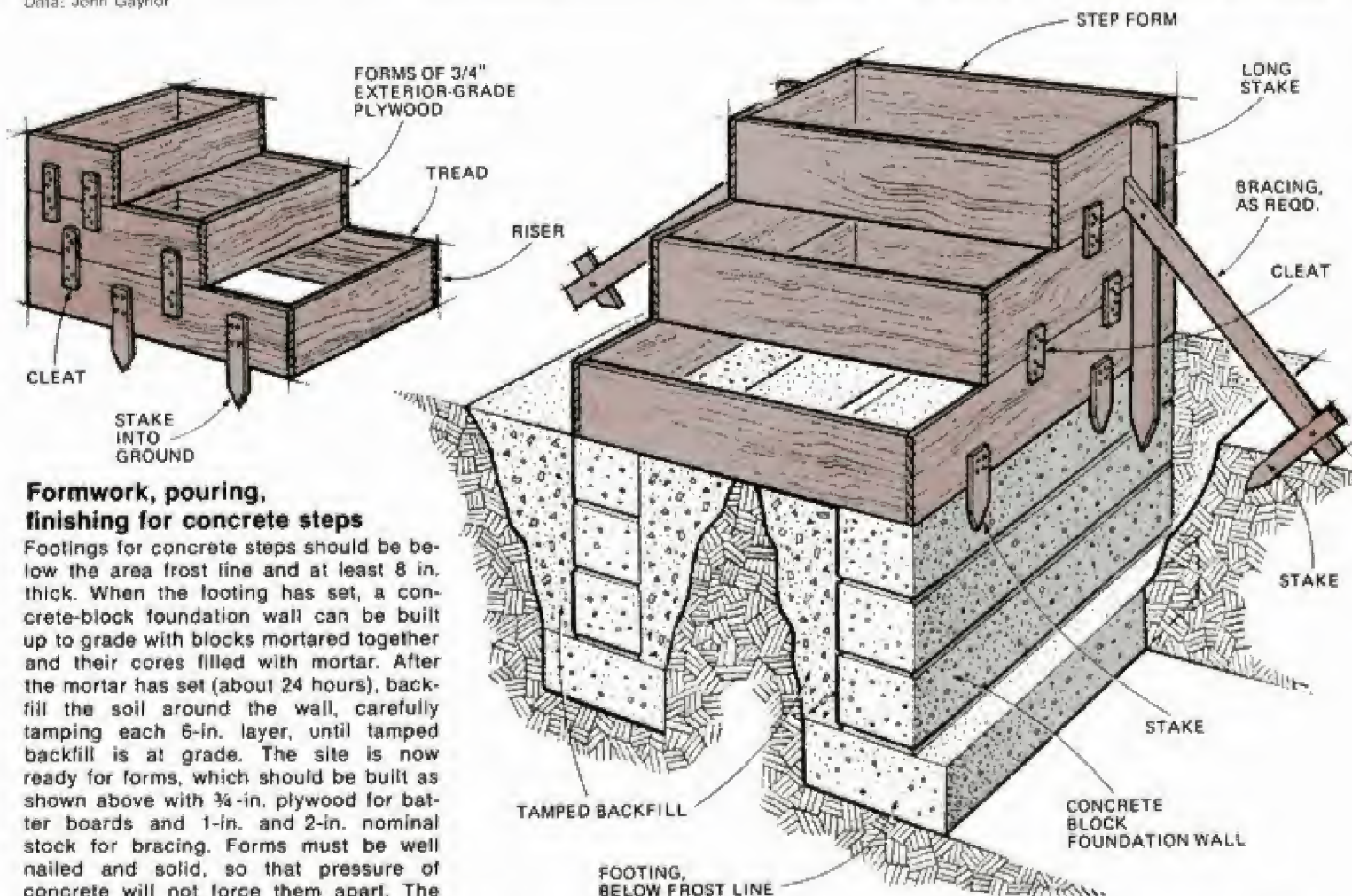




Data: John Gaynor

### Bonds, mortar and joints

Rowlock steps and header steps are the two basic brick-step bonds. Either can be laid with slight nosing (overlap of tread); this should not exceed  $\frac{1}{2}$  in. Note that foundation for header steps on opposite page is simpler. Type M (high-strength) mortar should be used according to directions; mix only what you can use in  $2\frac{1}{2}$  hours. Mortar can be colored with lampblack or pigments. Work from the bottom up, laying bricks on a  $\frac{3}{8}$ -in. mortar bed and checking with a level as you go. Flush mortar joints made with trowel edge will weather best. When mortar has set, rub with a clean brick to remove excess.



### Formwork, pouring, finishing for concrete steps

Footings for concrete steps should be below the area frost line and at least 8 in. thick. When the footing has set, a concrete-block foundation wall can be built up to grade with blocks mortared together and their cores filled with mortar. After the mortar has set (about 24 hours), backfill the soil around the wall, carefully tamping each 6-in. layer, until tamped backfill is at grade. The site is now ready for forms, which should be built as shown above with  $\frac{3}{4}$ -in. plywood for batter boards and 1-in. and 2-in. nominal stock for bracing. Forms must be well nailed and solid, so that pressure of concrete will not force them apart. The form is held in place on the foundation with braces as shown at right above.

Since steps of this type require a large amount of concrete, you are well advised to use transit-mix (truck-mixed) concrete, pouring the steps monolithically (as a single unit); the stiffness of the mix should make it unnecessary to close in lower-step treads. You can hand-mix and pour one layer at a time, but this is not really worth the extra effort, as it raises the problem of tying the layers together. Estimate the amount of concrete needed

by finding the volume of the steps in cubic feet and dividing by 27 to convert to cubic yards, and add 5 percent for waste. One cu. yd. is usually the minimum order for transit-mix concrete. Before pouring, give the inside of the forms a thin coat of form oil to keep concrete from adhering to wood. When the pour is complete, rap forms vigorously all over with a hammer; this helps the mix to settle and fill voids (honeycombs) that may occur next to the form boards. You should not

pour if the temperature is below 40°F. or if it is raining. Use a wood float to finish the steps—a steel trowel would give too slick a surface. When concrete has set for at least 36 hours, carefully remove forms. Rough spots can be rubbed smooth with a carborundum stone and water. Fill any voids at this time with a cement-and-sand mix, troweled and rubbed smooth with the stone while still wet. To cure, keep steps moist and covered (to retain moisture) for five to seven days. ★ ★ ★



# It's about time you bought a torque wrench

by Robert Taylor  
and Curt Wolfe

Whether you are a beginner or an advanced do-it-yourselfer, you should have a torque wrench. Not only should you own one, you should use it!

For some reason, a torque wrench is the tool most Saturday Mechanics and even professional mechanics put off buying. It's haste, perhaps, that leads to tightening nuts and bolts by "feel." But feel is not a good practice when accurate torque values are specified.

Various problems arise when fasteners are not torqued to specification, and some of them can relate to safety and involve major repair. More oil leaks, for example, are caused by overtightening than by fasteners that are too loose.

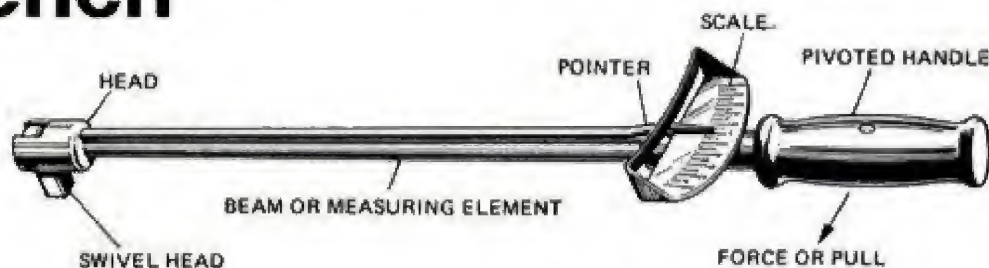
The prime example is leaky valve cover gaskets. Many of these gaskets allow leaks only because the screw or bolt holding the cover is too tight. The gasket itself is fine. What happens is that the valve cover gets bent out of shape and the gasket will not conform to the distorted shape. The result, of course, is a leak.

It's not exaggeration when one torque wrench manufacturer describes his wrench as a gauge tool that can be compared with a micrometer, dial indicator, level and many other precision instruments. It's that important to torque fasteners to spec.

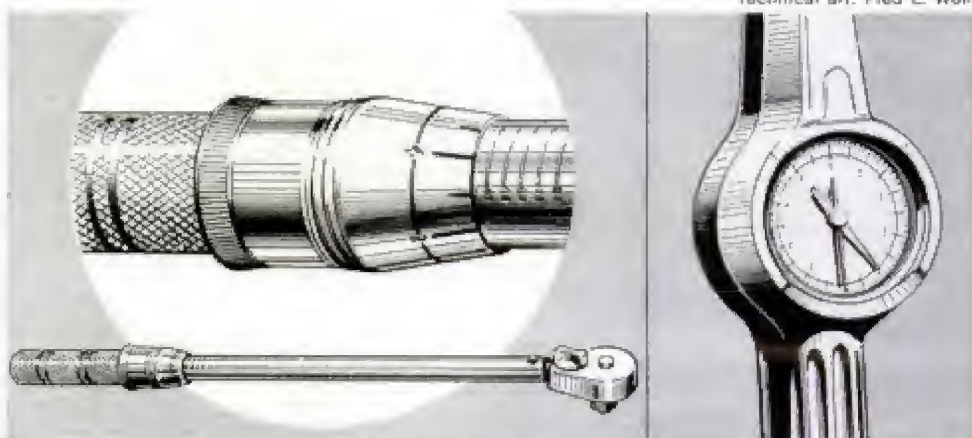
## Types of torque wrenches

You can find a torque wrench for almost any size job. They range from the very large to the very small. They come in various sizes, lengths and shapes. The round and double-round beam models, for example, are the types most often used in the automotive service field.

The tapered beam model, on the other hand, is more likely to be found in industrial use.



Technical art: Fred L. Wolff



Round-beam type of torque wrench is shown at top. This is the common automotive torque wrench available in standard foot-pound models or metric, meter-kilogram models. The round-beam torque wrench is also available in various ranges: Zero to 100 foot-pounds, for example, for cars and small engines. Most have  $\frac{1}{2}$ -inch square drives for use with your socket set. Prices range from \$10 to \$20. The

scale on the round-beam type at top indicates torque when the pointer is deflected in either direction. Other types of scales are shown above. At left is the micro-adjusting type which can be set to a specified torque: A click indicates when you reach the preset torque. Above, right, is the dial used on many commercial heavy-duty types. Most have memory pointers and read up to 250 foot-pounds.

Some manufacturers make torque wrenches that have built-in sensory devices so you can feel when the specified torque value has been reached. You preset the specified value before you start work. You feel a click when you reach the right torque.

Many of these types also use direct reading scales so you can use it either as a direct reading or sensory model.

## Torque wrench terminology

To be used correctly, it's important to know and recognize all the parts of the torque wrench. Torque-wrench manufacturers refer to these parts in operation and service instruction literature. So before using a new torque wrench it's important to study the owner's brochure carefully.

The illustrations on this page show

the basic parts of the typical beam-type torque wrench.

On the beam type, a pointer moves across the scale as you apply force to the handle. You stop when the pointer hits the torque value you want.

## Torque law

Torque is based on the law of the lever. Distance multiplied by force equals the torque around a point. This is illustrated on the opposite page. The distance between the centerline of the drive square and the centerline of the force being applied at the handle is the lever length of the torque wrench.

Most torque wrenches are made with a male driver or square at the end. The drive is used to fasten various attachments to the end of the



wrench. For automotive work, the  $\frac{3}{8}$ -inch or  $\frac{1}{2}$ -inch-square drive is most common.

Attachments can be divided into several classifications — extensions, sockets and adapters. Typical attachments are for slots, gears, shafts, drive pins, screwdrivers and various size sockets, of course.

With some torque wrenches, accurate readings can be made with any attachment even though applied lever strength may vary. With a bending beam type of torque wrench, however, the measuring element must have a fixed lever length. This is accomplished by designing it with a pivoted handle or having some kind of concentrated load position which will determine the applied load lever length.

The popular pivoted handle, sometimes called a floating handle, is designed so that your hand will fit around it a certain way: This positions the pulling force at a fixed point on the wrench.

### Using the torque wrench

There are times when you'll be using a torque wrench right up to its limits for measuring foot-pounds. Other times you'll be using it at the low end of the scale. Still, you should

select the wrench best for you, in terms of size and range, by considering the particular application you'll use it for. Always check the service manual for your car to see the specified torque values for the jobs you'll be doing most. Then select a torque wrench with a capacity so that the working range you most often use will be within the mid two-quarters of the scale.

For example, if 150 to 450 inch-pounds will be the torque range you will be using often, select a wrench with a 600-inch-pound capacity.

### Torque multipliers

Through the use of planetary gears, a torque multiplier will boost torque and at the same time allow a shorter lever length to be used.

The most popular torque multipliers use a gear ratio of 4 to 1. You can multiply the torque for a given leverage length and force by four. Or you can use one-fourth of the lever length.

Torque calibrations, incidentally, on better torque wrenches, are set in accordance with the National Bureau of Standards.

### Adapters, attachments, extensions

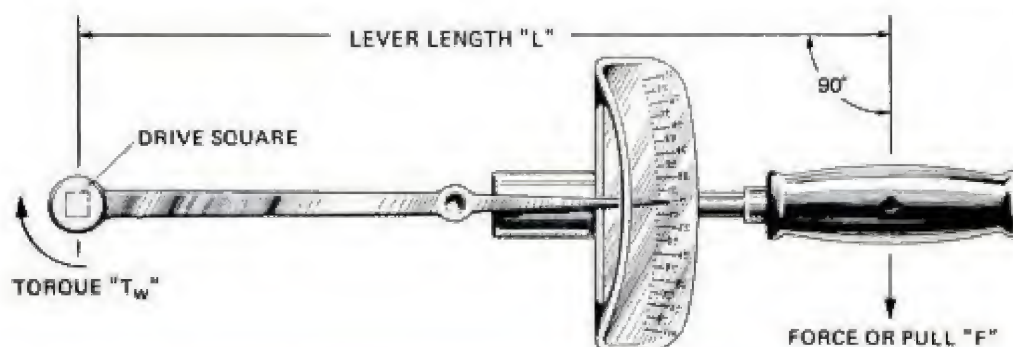
Adapters and extensions can make

a torque wrench multirange and multipurpose. One torque wrench can be made to do the work of several with the use of adapters. For instance, an adapter equal to the lever length of the torque wrench will multiply the torque by two. Therefore a 100-foot-pound torque wrench can be used to tighten bolts up to 200 foot-pounds.

You'll encounter special jobs where conventional adapters, attachments and/or extensions still make it awkward or almost impossible to reach the work. For very special applications, you'll find that irregularly shaped and designed accessories are available.

Special attachments are relatively expensive, and you shouldn't invest in them until you know you're going to need them. What you do need before you can even accurately tighten your sparkplugs the next time you replace them is a torque wrench!

An investment of \$10 to \$20 will buy a good torque wrench for Saturday Mechanic use. It's important for doing the job right, and when you have one you'll find that you'll more readily move on to more difficult automotive servicing with the knowledge that you've got the right tools for the job. ★ ★ ★



**Torque law** is based on the lever principle. You multiply force by lever length to get torque. Torque is measured in foot-pounds (or inch-pounds at smaller values) or in meter-kilograms if the scale is in metric. A standard round-beam type with a 0-100 foot-pound range is best for automotive use. However, before buying a torque wrench, check the range of torque values specified for the various parts of your car in your service manual.

### Some of the fasteners on your car that should be torqued

#### BODY

Engine compartment hood mounting bolts  
Radiator mounting bolts  
Shock absorber mounting bolts  
Wheel-to-drum mounting bolts (front and rear)  
Front-wheel-bearing adjusting nut (both sides)  
Door-to-body mounting bolts (front and/or rear)  
Trunk-to-body mounting bolts  
Body-to-frame mounting bolts  
Bumper-bracket-to-frame mounting bolts (front and rear)

#### ENGINE

Sparkplugs  
Engine head bolts and pan bolts  
Valve-cover screws  
Main-bearing cap bolts and connecting rod cap bolts

Carburetor to intake manifold stud nuts  
Fuel-pump attaching bolts  
Alternator/generator bracket to engine bolts  
Starter attaching bolts  
Airconditioner mounting bolts  
Power steering mounting bolts  
Flywheel-to-crankshaft mounting bolts  
Motor-mounts-to-engine bolts  
Motor-mounts-to-cross member bolts  
Transmission-to-engine mounting bolts  
Distributor-to-engine mounting bolts  
Exhaust manifold(s) to engine mounting bolts

#### POWER TRAIN

Front U-joint yoke to transmission mounting bolts (some cars)  
Rear U-joint yoke to third member attaching nuts or bolts  
Third member to differential housing mounting bolts



# Sssh!

## Noise reducers at work

Built-in and add-on systems cut hum, hiss and other hi-fi system noises.



**Fuzzy sound-wave** (above) is a very low-level symphonic passage carrying unwanted noise, chiefly hiss.



**With hiss diminished** (above), waveform looks and, more important, sounds better thanks to noise reduction.

by Larry Zide

Noise—record scratch, static, tape hiss—has plagued sound reproduction systems since Edison first recorded *Mary Had a Little Lamb* on tinfoil.

The problem isn't as acute today, of course: Smoother record materials, FM broadcasting, improved tapes and quieter electronic circuits have all dramatically increased the signal-to-noise (S/N) ratio. So now, major leaps in S/N require new techniques and equipment. (Signal-to-noise ratio is the difference in decibels between the loudest signal a system can handle without unacceptable distortion and the quietest signal audible above the system's built-in noise.) Today's hi-fi listener has a whole gallery of such new equipment to choose from: Dolby, dbx, DNL, Burwen, RG, ANRS, autocorrelation, and perhaps still others to come.

But before discussing how these systems solve the problem, let's see just how severe the problem is. An ideal home music system would have an S/N of at least 80 db—the range between the quietest sounds that

average home noises won't mask and the loudest ones the average ear can take before it begs for relief.

Unassisted, today's home sound systems aren't quite that good. The best of our present systems is the phonograph disc, which can achieve an S/N of as much as 75 db—not counting clicks, pops and the noise it gradually acquires if you don't care for it properly. The disc, in fact, is more than good enough for you to hear the noise of the master tape (less than 70 db in final form) through it.

Home tape machines range from 60 db signal-to-noise ratios for the best open-reel models (55 db is far more typical) to a low of 35 or 40 db for slow-speed, narrow-track systems such as cartridge and cassette (high-quality cassette units barely make it up to 50 db). And in FM, practical limitations reduce the available S/N to about 55 db.

But your ears hear noise, not numbers: At the low sound levels typical of hi-fi noise, the ear is most sensitive to middle frequencies, least sensitive to low ones. That means hum, turntable rumble, and other low-frequency noises will be less annoying

than the broadband hiss typical of tape and FM but also audible on records—and that's the noise today's noise-reduction systems work hardest at eliminating.

In general, a system with a 50 db of S/N will be quite audibly hissy when it's played loud. With an S/N between 50 and 60 db, hiss will be audible, perhaps obtrusive, but not a prime annoyance to most listeners. When the signal-to-noise ratio gets up into the 60 to 70 db range, noise becomes barely audible, even in quiet surroundings; beyond 70 db, noise begins to vanish.

The first approach to making that noise vanish was the *compander*—actually matched compressor and expander circuits. The compressor narrows the signal's dynamic range in recording, making soft sounds proportionately louder and loud sounds a bit softer, so that the softest sound in the original signal is always above the noise level of the recording medium (see diagram above). Matched expansion in playback resoftens the soft sounds and reboosts loud ones. Noise—softest signal on the record—is softened to near inaudibility.

But companders tended to produce



"pumping" or "breathing" noises, in part because compression and expansion were never quite a perfect match, also because background noise level would rise and fall with the music.

Then came Dolby. It divided the signal into frequency bands, each compressed and expanded separately so that noise in one part of the spectrum wouldn't "breathe" with changes in levels of the other frequencies. Since our ears can't pick up soft sounds when there are louder sounds of similar frequency to be heard, changes in noise level within each frequency band will be masked by changes in signal level within that band. Only low-level signals likely to be lost in the noise are affected; high-level signals aren't touched.

By now, most professional master tapes, especially of classical music, are made with this Dolby "A" system. For home use, there's a less expensive Dolby "B" system that affects only one band of high and middle frequencies to reduce hiss.

JVC makes a somewhat similar system, called ANRS, which it claims produces less distortion and is compatible with Dolby (tapes made with one type of processing can be played back with the other).

Still another system is the dbx. It's a broad-band compander, but unlike earlier ones, it matches compression and expansion automatically, with such accuracy that pumping and breathing are no longer problems.

Dolby, ANRS and dbx, all "double-ended" systems, must be used in both recording and playback. That means a built-in compatibility problem: Since the signal is altered in recording and altered back in playback, it will sound altered unless it's processed by the system at both ends.

In the case of Dolby B, straight playback of an encoded signal without reprocessing seems only to sharpen the treble unnaturally; on good equipment, turning down the treble control will more or less correct for this—and on portable recorders with small speakers, the extra highs are an improvement. The same should be true of ANRS.

With dbx, the story's different. Its broad-band compression approach has the advantage of offering more noise reduction (30 db to Dolby B's 10 db) and of keeping its home and studio systems compatible with each other. But it also has the disadvantage that its encoded signal, compressed to half its original dynamic range, sounds as if someone were sitting on the music when it's heard without a dbx decoder.

Dolby decoders are now very easy to get. They're available as acces-

(Please turn to page 100)



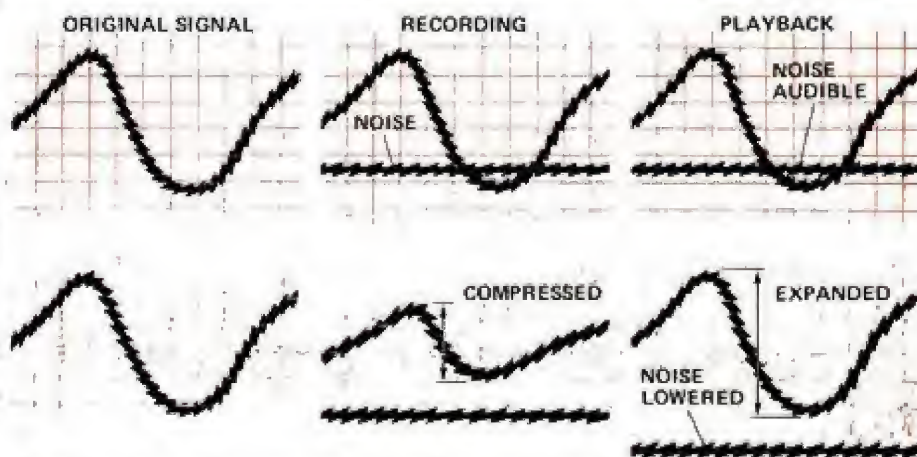
Dolby circuits are built into many cassette decks like this Teac (left), other components like Marantz receiver (above).

Autocorrelator built into Phase Linear 4000 preamp is now also available separately.



The dbx companders compress signal in recording, expand in playback as in diagram below, have noise filters to reduce "breathing" effects (see text).

Burwen dynamic noise filter reduces high-frequency response when there are no signal highs to mask noise.



Noise added in recording (top) is heard only when signal isn't loud enough to mask it. Com-

pressing signal (above) keeps it above noise; expansion restores signal, cuts noise.



# Inside tips to protect outside surfaces

Exposed outdoor masonry and metal structures often need refinishing—and the procedures can be tricky. Here's what the experts do.

**F**orgotten like stepchildren in the usual painting manuals are techniques for refinishing concrete and metal fixtures used outdoors. Wood has always claimed attention as the favorite. But concrete patios, porches, stoops and walls, plus metal railings, lampposts, fences and furniture need equal attention from the concerned homeowner.

Guesswork or erroneous answers to questions of paint selection and surface preparation have forced many a handyman to make the wrong move—such as applying fresh paint to dry (yes, dry) concrete when in most cases it actually should be damp.

What follows are some inside answers to some outside problems.

Painting masonry is simple enough, but there are right and

wrong ways. Purpose, surface condition, and expected exposure all combine to dictate the right paint to use.

Concrete is quite alkaline, and alkali is an enemy of many paints. Portland cement is not only in concrete, but in brick and stone mortar, concrete and cinder blocks and stucco. While the alkalinity at the surface decreases with weathering and age, moisture in the concrete may bring more alkali to the surface. Well aged and dry masonry surfaces may be considered comparatively free of this alkali, but you must be sure there is no water present.

In this latter condition, almost any suitable paint (conventional house paints) can be employed with good results. But in case of doubt, a paint

with built-in resistance to alkali should be used, and for the best assurance of satisfactory results no matter what the age of the concrete, these special resistant paints must be used.

Of the many alkali-resistant paints on the market today, the one selected should be for the expected exposure. For example, if protection is required rather than beauty, select a type of paint designed for the protection needed. Floor paints should be selected for floors and exterior paints for exterior surfaces. In general, a careful study of the instructions on the labels should be your guide. Here are available types of alkali-resistant paints:

**Latex paints.** These paints, inherently resistant to alkali, are made from emulsions of resinous materials in water. While other ingredients used in the paint may affect the degree of resistance, any latex paint designed for use on masonry may be used with confidence. Just be sure that the latex paint selected is intended for the surface to be painted, since latex paints come in a wide variety of colors and types for interior or exterior walls, ceilings, floors and other surfaces. Alkyd emulsions (read the label) are not alkali-resistant, so avoid their use on new masonry surfaces. Since latex paints are water-thinned, the surface to be painted need not be absolutely dry. Indeed, it should be dampened before applying the first coat.

**Portland cement paints.** Purchased as dry powders and mixed with water before use, these paints set by the hydration of the cement and should be applied to damp surfaces which must be kept damp until the cement in the paint matures (48 to 72 hours). Portland cement paints contain little organic material and are not subject to attack by alkali. They have a long history of success in painting masonry, but there are points to remember: 1. They may require treatment with a surface conditioner if other types of paints are applied over them, or



**Surface should be dampened** and free of peeling and chalking paint when you apply latex to concrete. New concrete should be allowed to weather a year or so before coating.



may need complete removal if peeling has developed. 2. They are not suitable for floors and other surfaces where abrasion is anticipated.

**Oil-base stucco, masonry paints.** These types are similar to conventional house paints in most respects, but are usually reinforced with certain resins to improve their alkali resistance. Their application, effectiveness and general behavior are similar to conventional house paints, but they are least resistant to alkali.

**Solvent-thinned rubber-base paint.** These contain a synthetic rubber-type resin and are thinned with an organic solvent, these provide excellent resistance to alkali and water penetration and resist abrasion. They are available in a wide range of colors for basement and porch floors, swimming pools and walks exposed to the weather.

Regardless of the type of paint you choose, preparing masonry surfaces for painting is important: 1. Clean that surface! This rule applies whether the surface is new or old.

2. Use a wire brush to remove all dirt, loose particles and other extraneous materials which might interfere with paint adhesion. If there is a white saltlike material adhering to concrete, stucco or mortar, it is probably efflorescence. Efflorescence is caused by moisture which dissolves salts in the interior of alkaline materials and carries them to the surface. Efflorescence must be removed before painting or repainting. Since it is caused by the presence of moisture, preventing moisture from entering the masonry material will prevent efflorescence and also prevent damp walls.

3. Remove all grease or oil by washing with a cleaner made for the purpose or detergent and water. Poured or precast concrete may have a "release agent" on the surface which must be removed by solvent or by several months of weathering action.

4. Finally, wash off or hose off surfaces unless efflorescence is present. Allow the surface to dry unless a water-thinned paint (latex or Portland cement) is to be used. If efflorescence is present, dry-brush it away along with all dirt, dust or other extraneous material.

5. For porous surfaces, as with some forms of concrete masonry, a fill coat or grout coat is necessary before painting. Whether or not the fill coat dries with hairline cracks, the finish paint coat will provide a good seal. To prevent the cracks from showing through the finish paint, allow the fill coat to mature before painting it.

**Before you start painting.** Check the following points: 1. If the concrete, other masonry material or the mortar is well aged (one to two years exposed to the weather except for unusually massive concrete), the chances are that most of the alkali has been washed out or neutralized by the atmosphere. However, age increases the likelihood of contamination by dirt, oil and grease, depending on environment. Hence, make doubly sure your cleaning job is thorough.

2. If the surface has been previously painted, and the paint is in fair condition, use a wire brush to remove loose extraneous materials such as dirt. If the old paint is loose, peeling or heavily chalked, then you must sandblast or otherwise remove all old paint before repainting.

3. If the surface is to be repainted, and the old paint is just moderately chalked but otherwise "tight" and nonflaking, and you intend to repaint with a water-thinned coating (latex, Portland cement), a surface conditioner should be used before painting. The manufacturer of the paint may recommend adding a conditioner to the first coat. In any case, follow his directions.

4. If a water-thinned paint is used, stains may develop when in contact with metals. Thus, iron, copper or other metallic objects imbedded in the masonry surface, or adjacent to it, should be primed with a good anti-corrosive primer before painting. Look for nails and other metallic objects. Always prime them before applying a water-thinned paint.

### Painting ornamental iron

Being metal, ornamental porch railings, window airconditioners, gym sets, lampposts and galvanized gutters are subject to rust and bleed-through once the painted surface is chipped. Before repainting, wire-brush bare metal spots thoroughly to remove all loose paint. A flat file will remove the little domes of rust a wire brush can't. Handy for use on metal railings is a long-handled wire brush most paint and hardware stores sell for about \$1.75.

Clean and coat all chipped areas on metal with a red-lead primer. This rust inhibitor permits most any good-quality, oil-base enamel to be used on exterior ornamental railings and the like. Your paint dealer will help you pick one to withstand sharp temperature changes without chipping or cracking and that will resist moisture. Some makers offer a one-coat combination primer-finish in a choice of colors in spray cans. One coat is said to give good protection.

\*\*\*

## New water-based varnish: boon to home finishers



The old dilemma of how to create an elegant patina for wood surfaces without the frustration of applying varnish that sags, runs, crawls or dries too fast has been solved with a new water-based varnish as easy to apply as any latex paint. PPG Industries, manufacturer of Pittsburgh Paints and Rez wood finishes, has developed the clear varnish satin finish that uses water as the primary solvent.

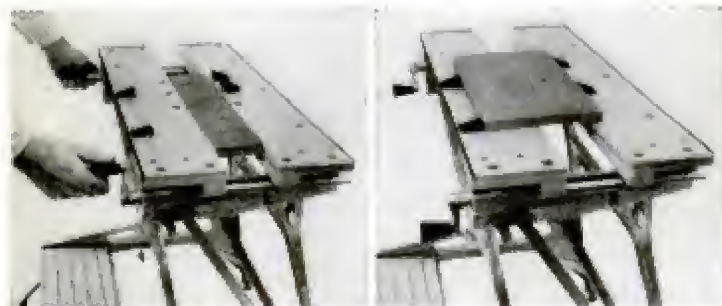
According to PPG, a unique characteristic of the Rez water-based clear varnish is its milky appearance during application. This helps the finisher avoid the skips and misses often associated with conventional varnish application, because he can clearly see exactly where the new varnish has been applied. The finish dries to a clear satin-gloss finish, which the company maintains is as durable as conventional varnish under normal conditions.

It dries to the touch in an hour, can be recoated in four hours, and is available in all Pittsburgh decorating centers and dealer stores in pints, quarts and gallons for residential and commercial use. It may be custom-tinted to provide color as well as surface protection. About \$2.87 per pint and \$4.49 per quart.

\*\*\*



# B&D's new portable workbench



Using independent vise handles, you can open top to desired width. Half-top away from operator moves; near half is fixed. Four vise pegs extend vise capacity. Photo below demonstrates Workmate's versatility in holding odd shapes.



Though a bit unlikely looking, the Workmate from Black & Decker Mfg. Co. has to be one of the most exciting new shop tools I've ever tested. Ever since I set it up, the device has been an asset in my shop: After using it—primarily as an auxiliary work surface—I can report it does many things so well that I'd now find it inconvenient if I had to get along without it.

The tool had impressive sales records in England and Canada before it was introduced here last August. Despite its \$90 price tag, it appears that acceptance is just as enthusiastic on these shores.

The bench features two working levels for maximum comfort (note the four adjustable feet for each level). The Workmate folds relatively flat for on-the-wall storage, but since its vise-top accepts just about

any size and shape material, I opt to leave mine set up full time. Conclusion: You owe it to yourself to give the tool a long, hard look.—Harry Wicks, *Workshop Editor*

## SPECIFICATIONS—Workmate 79-001

Weight: 24 lbs.  
Dimensions: 29 in. W, 26 in. D, 32 1/4 in. H.  
(alternate work height, 23 1/4 in.)  
Vise capacity: 10 in.  
Price: \$89.99.  
Manufacturer: Black & Decker Manufacturing Co.,  
Towson, Md. 21204



Vinyl is stapled along edges or cemented where there's no molding to hide staples.

## New vinyl flooring forgives mistakes

A tough new sheet-vinyl flooring by Armstrong called Tredway has what chemists call a "memory." When the product is rolled face-side out at the factory, the outer circumference of the roll is stretched and the backing is compressed. After installation, the floor covering, because of its memory, gently returns to its original dimensions before it was rolled. This action assures a tight, smooth fit, making it easier than ever for the do-it-yourselfer to install. If vinyl is slightly undercut, it can be stretched. If overcut, wrinkles will gradually disappear. It forgives mistakes.

It has a clear vinyl "wear layer," foam inner-cushion and special backing, yet is easy to cut and trim. It's available in two widths—6 ft., primarily for professional installation; and 12 ft., preferred by most do-it-yourselfers. The 12-ft. width covers an average room in one piece. It comes in two patterns, four colors. ★★





# We could all use less friction.

Friction? Who needs it?  
Friction leads to wear and tear.

STP Oil Treatment does something about friction by helping to protect your engine from it. Just add a can to the crankcase when the oil is changed, and the first time it's down.

That'll help the oil lubri-



cate better than it would without STP. And a well lubricated motor is the best way to help reduce oil consumption, bearing wear and prolong engine life.

Try a can of STP Oil Treatment. See what driving's like when everything's running smoothly.

**It helps your oil do a better job.**






# PORT FOR PEAK PERFORMANCE

At secret marine laboratories on Florida's southeast coast, next year's outboards are getting rugged graduation exercises.

by Bill McKeown  
BOATING EDITOR



From over 100 runabouts, racing hulls and cruisers stored four levels high, plus up to 70 in the water, any model can be rigged for immediate testing with suitable motors or engines.

Photos: Jim Jost and Earl Prince



Sun and salt, two of the most destructive enemies of marine equipment, meet OMC equipment head-on all year on special exposure racks. Test-base manager Jim McFarland checks gear for signs of corrosion.

One hundred nautical miles down the Intracoastal Waterway from Cape Canaveral, where futuristic space vehicles are tested, outboards of the future are out and running in tests to improve water travel on Earth. From big unmarked buildings hidden behind a breakwater near Stuart, Fla., research and development engineers launch models that may power pleasure boats for next year and the 1980s as well.

Boatmen will never see many of these experimental motors, but Outboard Marine Corp., largest manufacturer in the field, has allowed its





**In-water oscilloscope readings** give test engineers a chance to study ignition for low and high-rpm peak fuel economy.

**Blasting a Glastron off a wake,** PM's test reporter-driver McKeown repeats test-driver Evinrude's photo feat of 50 years ago.



**Wheeling a well-battered but sturdy Boston Whaler** into take-off position from a wave, PM's McKeown noted 25-hp shrouds hid new 35s.



**PM's high-powered test team:** OMC chairman Ralph Evinrude, "Mr. Two-Cycle Himself" OMC president Charles Strang and PM's McKeown.

Evinrude Div. to give PM readers an exclusive inside look at where the new power for so many pleasure craft comes from.

Here outboard motors, OMC engines and stern drives, components, cowls, wiring harnesses, tanks, props—every item that can wear from use or corrode from salt—are given performance and exposure testing under tropic sun and water conditions.

In one large storehouse, over 100 runabouts, racing hulls and outboard cruisers are stacked on racks four levels high, each ready for instant forklift launching. Set up with vari-

ous motors and props, the rigs are slammed through the punishing chop of open bays, given speed endurance runs down sheltered backwaters, skimmed over sand and oyster-shell shoals that flip up lower units and scour props with the equivalent of years of normal use.

Then offshore, surging hour after hour into the open Atlantic swells, the motors get commando course treatment. The engineers hope that any weakness will show up or break down. Complete reports go back to Evinrude in Milwaukee, Johnson and OMC Stern Drives in Waukegan, and

OMC Parts and Accessories in Galesburg, Ill. Corrections are made to prevent any failures once production motors go out in the field.

Testing here, however, is much more than full-throttle heroics. Test center chief Jim McFarland and his crew of 45 specialists maintain complete paperwork records on the life of every test item. Most performance for the least fuel consumption is a primary goal; output of all engines at various rpm settings is monitored. Carburetion refinement receives continuous attention. Oscilloscopes study

*(Please turn to page 112)*



# Patio Partners you can make

Striking and easy to build, these handsome structures add a special touch to your yard.

by Harry Wicks

WORKSHOP EDITOR

Art: Peter Frey

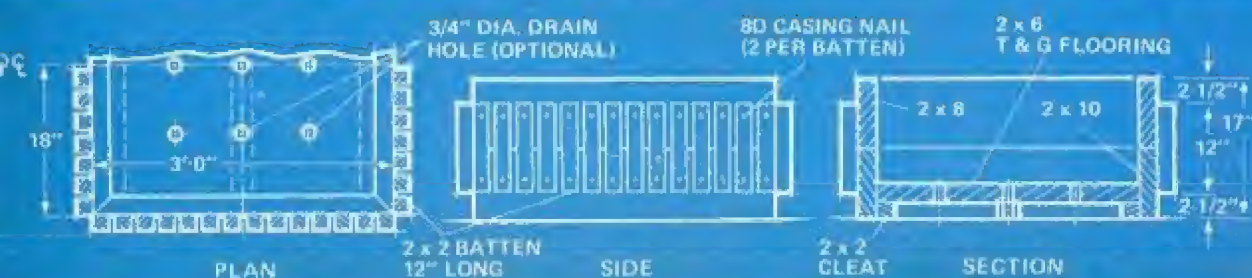


Photo: Western Wood Products Assoc.



## Planter

Quickly built, this planter's bottom and sides can be of 1 1/2-in.-thick (actual) tongue-and-groove construction lumber such as Douglas fir or ponderosa pine. Join parts as shown using 8 and 16d galvanized nails; finish planter with either latex or oil-based exterior stain.







Photos: California Redwood Assn.

## Storage gazebo

The key to construction of this gazebo is the simplicity of the roof design—the joining of two metal hoods or awnings. Since the metal roof will dictate the gazebo's overall dimensions, have it fabricated at your local sheet-metal dealer and determine your building's size from it.

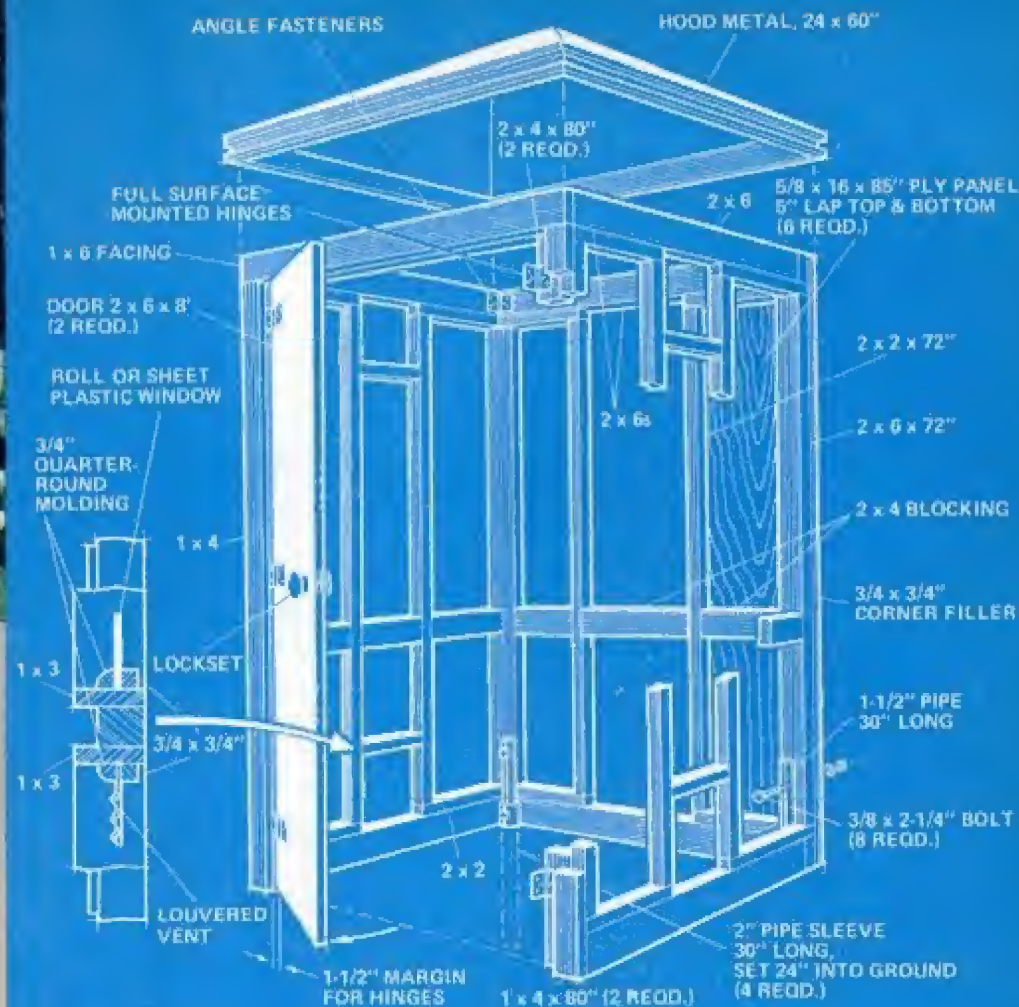
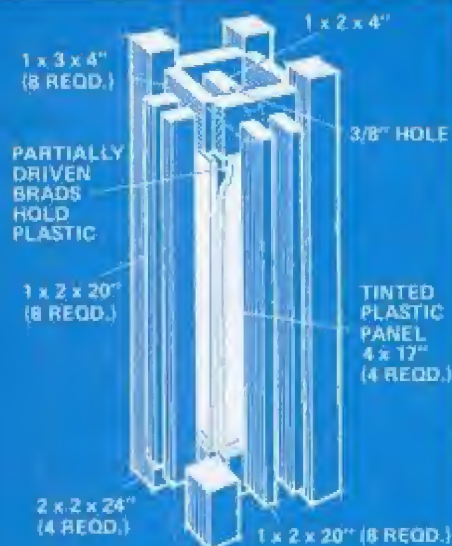


Photo courtesy of California Redwood Assn.



Electrical Materials: swag kit with chain; light socket; coupling, 1/8 in. dia.; threaded tube or pipe, 1/8 in. dia.

Photo: Simpson Timber Co.

## Hanging lamp

Contemporary lamp of redwood adds a bright note to patio or entry. Use clear window glass or, for a softer light, frosted glass or opaque sheet plastic.



Upgrading your deck, patio or back yard is a sure way to guarantee more enjoyable use of that space. To help provide ideas you can use, we've rounded up nine attractive projects that dress up any outdoor area. Some projects require a little more know-how than others, but all are in the do-it-yourself category. Several of the planters, for example, can be built in a Saturday work session. Plans for all yard ideas are given.

The usual woods used for outdoor construction include redwood, Douglas fir, ponderosa pine and Idaho white pine. Each has a color of its own and this, probably more than any other factor, will determine which lumber to use. You might well apply stain or treat outdoor projects with a clear water repellent. Use only galvanized or aluminum nails for all construction. Otherwise, you will have ugly rust stains.

### Storage gazebo

The roof dictates the overall dimensions of the shed. The length of the gazebo will be the length of the





## View divider

Clean lines of this redwood fence make it adaptable to almost any back yard. The cutouts in the privacy screen serve a dual function—they let breezes pass and provide a place to display plants.

Photos: California Redwood Assoc.



## Grille fence

Geometric pattern created by latticework is pleasing to look at, doesn't block airflow.



## Redwood planter

Simplicity is the design key here. One pair of box sides is framed with heavy 1½-in.-thick stiles and rails, while the second pair of sides is without any decorative treatment. Clear wood preservative adds esthetically pleasing finish.

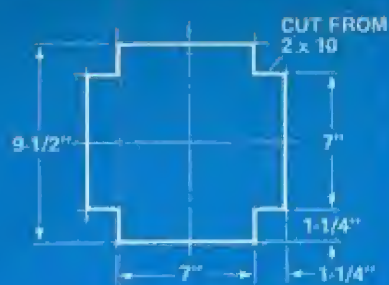
Courtesy Western Wood Products Assn.



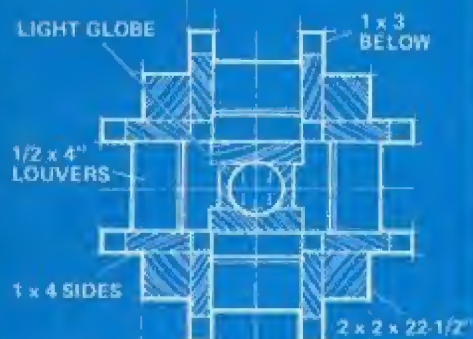
## Post lamp

Good lighting is essential for any deck. If the lamp is entirely of wood, it's sure to go with any outdoor decor. Simply stain wood to blend with patio.

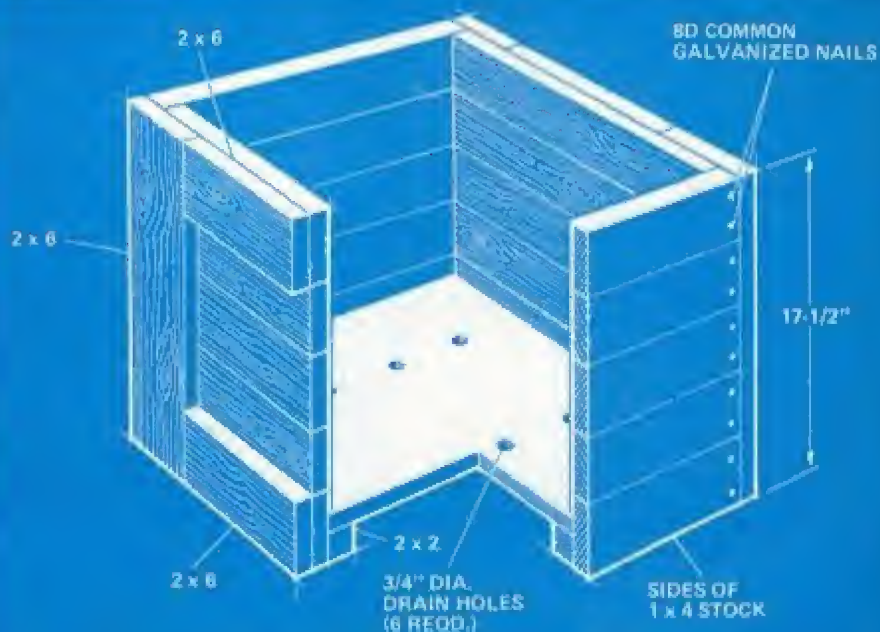
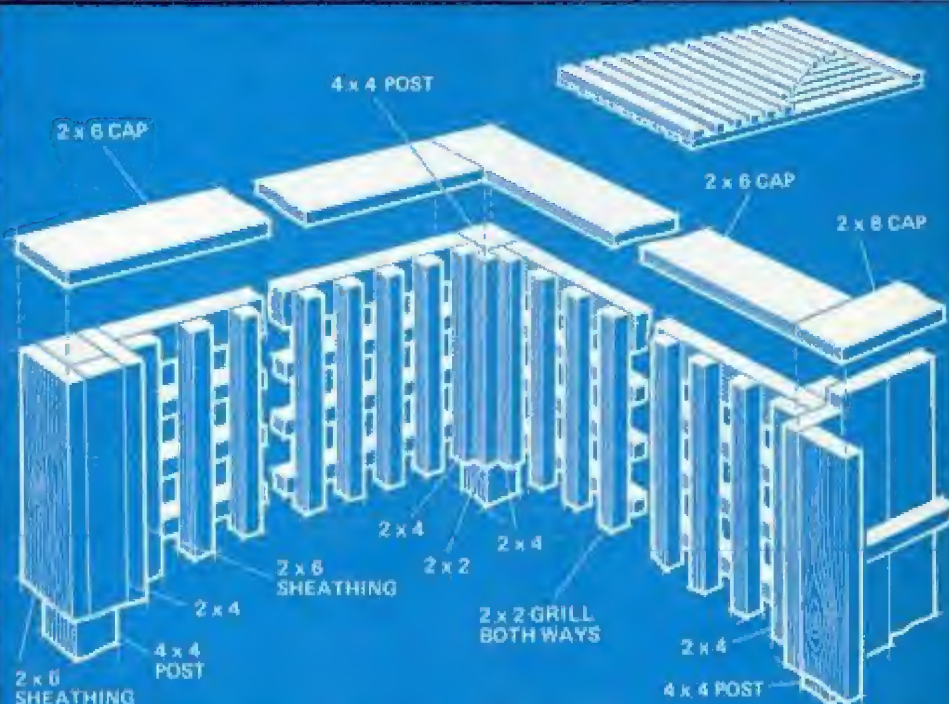
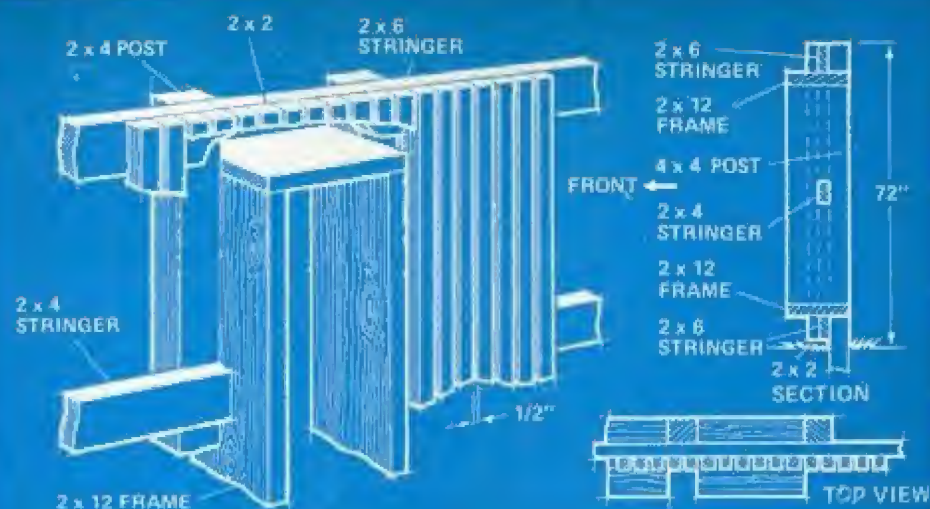
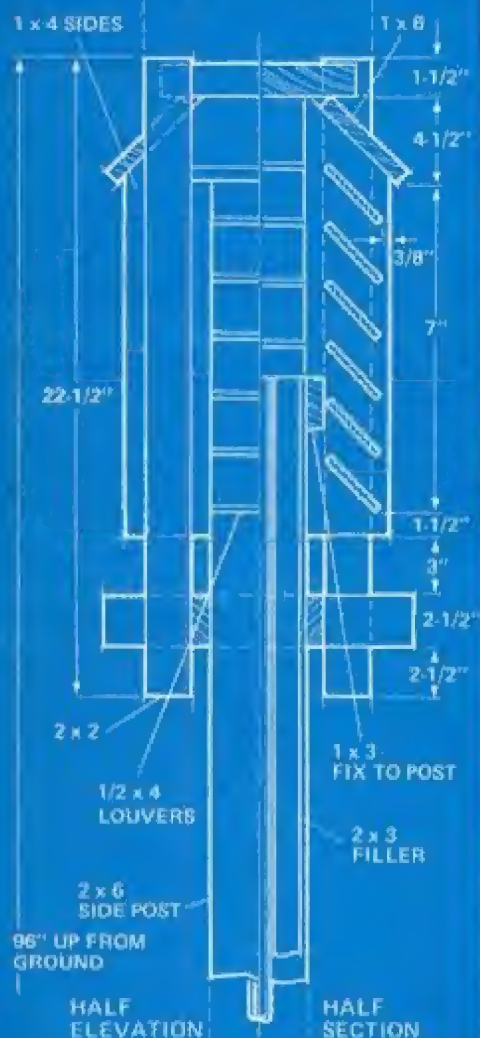




REMOVABLE TOP



PLAN AT LAMP



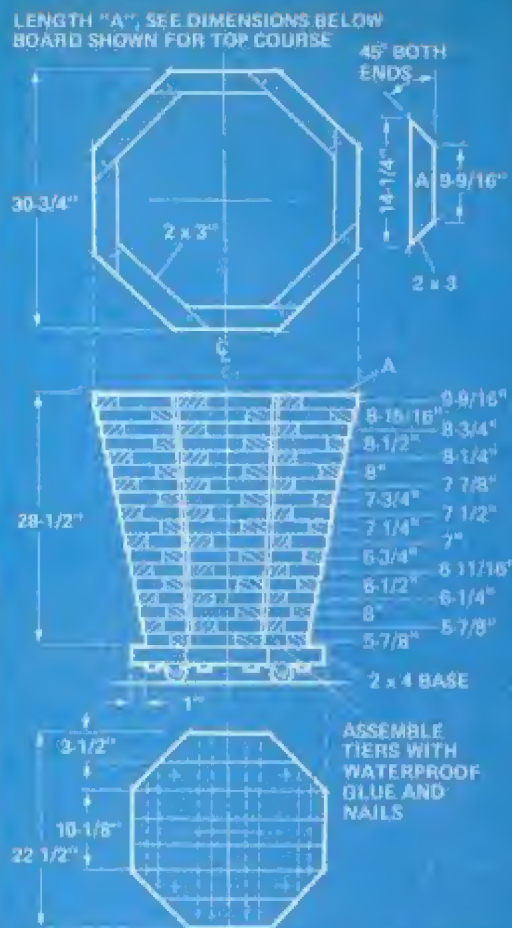




## Octagon planter

It can be built of western red cedar for less than \$50. Planter shown has 30½-in. dia. at top and stands about 32 in. high on casters. The 18 courses that form the sides are 2x3 (nominal) lumber. Note dimension "A" for each course: This is the inside measurement as shown. The easiest way to assemble the planter is to work upside down, starting with the top course.

Photo: Western Wood Products Assn.



hood minus material thickness, while width is double the awning projection. Height, of course, is determined by the pair of 80-in. doors plus the door header above.

The least expensive way to get the roof is to join two metal hoods or awnings that are commercially available, or you can have the roof fabricated at a local sheet-metal dealer using the photos and drawings as guides.

### Redwood planter

Because of its large size, this box is built of tongue-and-groove stock. Assemble as shown in the drawing using galvanized nails; weatherproof glue is optional.

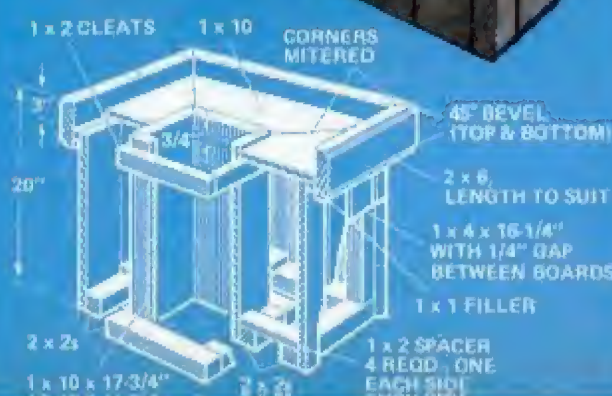
### Hanging lamp

Constructed of redwood, this lamp is perfect for entryway or patio. Set plastic or glass behind the 1x2 verticals and fasten the panes with brads partially driven into the horizontal members (1x3s) at top and bottom. Attach the 2x2 corners by drilling and nailing to the horizontal members as well. Drill a hole in the spacer block to accommodate the electrical threaded tube, and nail the block in place. Install electrical components as shown, and finish with

(Please turn to page 111)



Photo: Stephen Walton



## Stained planter

Well suited for holding shrubs or plants, box has sides capped by 2x6s; outside edges of 2x6s are chamfered for pleasing effect.



# Why don't other TV/Audio home study schools put prices in their ads?

## Maybe they can't match this value!

NRI will give you complete TV/Audio service training with a solid state 25" diagonal color TV training kit, and all the electronic instruments and training services you need for as much as \$600 under the next leading home study school. Only NRI gives you a choice of five ways to learn, starting as low as \$370... with convenient, inexpensive time payment plans.

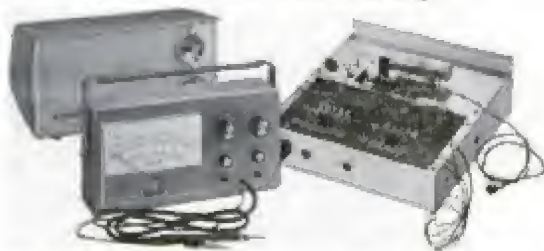
NRI pays no salesmen. We buy no outside "hobby kits" for our experiments and training kits. We pass the savings on to you, giving you the top educational value available anywhere.

## Take your choice in TV/Audio Training

Only NRI gives you a choice of *five* courses in TV/Audio servicing. Each comprehensive course features bite-size lessons, special reference texts, special engineered "power-on" training kits, and service instructions for black and white TV, color TV, FM multiplex receivers, PA systems, antennas, radios, tube, digital circuitry, transistor, and solid state circuits.

## Good with 7 kits...\$370 or low monthly terms

An up-to-date, comprehensive servicing course in which you build and experiment on your own solid state radio, volt-ohmmeter, and experimental electronics lab. Course covers FM multiplex receivers; tube, transistor, digital and solid state circuitry; black & white and color TV servicing.



## Better with 11 kits and b/w TV...\$465 or low monthly terms

A complete course in black and white and color TV servicing. You build and experiment with your own solid state radio, volt-ohmmeter, electronics lab, and 12" diagonal solid state black & white portable TV.



## Better yet with 11 kits and 19" diagonal Color TV...\$795 or low monthly terms

Excellent color TV training with kits and experiments to build a solid state 19" diagonal color TV, complete with handsome cabinet, along with extra parts for performing experiments. Also includes electronics lab, and volt-ohmmeter. This \$795 course is the lowest priced "hands-on" color TV course available anywhere.



## Best with 14 kits and 25" diagonal Color TV...\$1,095 or low monthly terms

Master training includes kits and experiments to build NRI's unique "power-on" training 25" diagonal color TV (complete with cabinet); 5" triggered sweep oscilloscope; TV pattern generator; 3 1/2 digit digital multimeter; solid state radio and electronics lab.



## Plus Advanced Pro Color...\$645

or low monthly terms

Color TV servicing for experienced technicians. 18 color lessons, 5 manuals, and an NRI 18" diagonal color TV included for "power-on" training.

**AVAILABLE FOR CAREER STUDY UNDER GI BILL.**  
Check line on card for details.



**NRI SCHOOLS**  
McGraw-Hill Continuing Education Center  
3939 Wisconsin Avenue,  
Washington, D.C. 20016



# IMPORTS AND MOTORSPORTS



## Give you a hundred

Renault's new luxury sedan, the 604, will be here in the fall, and will join the French automaker's 504 models in the U.S. market. The 504 is available as a four-door sedan or wagon in either gasoline or diesel versions. The 604 will be a single model—a four-door sedan with a new 2.7-liter engine that develops a strong 150 hp. This engine, developed jointly by Renault, Renault and Volvo for their off-of-the-line cars, is also used in the new Renault 30TS and will power the '76 Volvo 264.

Shown earlier this year at the Geneva Auto Show, the 110-inch-wheelbase 604 is conservative in styling, though done by Pininfarina, and conventional in drive-train layout (front engine/rear-wheel drive). The 604 is expected to be in the \$8000 to \$9000 range and will have as standard equipment: airconditioning, power windows, power sunroof and other luxury items in addition to the engineering features such as four-wheel disc brakes, fully independent suspension and more. Like so many other cars today, the 604 is targeted to rival some of the Mercedes market: a luxury car offered at a lot less money.

The 3300-pound 604 has a top speed slightly over 100 mph—good to show you can safely pass a car going 60 mph.

## Best wagon

Now there's a station-wagon model in the Honda Civic. It has fwd, CVCC engine and other features of the CVCC sedan. The 2000-pound wagon has a cargo volume of 49 cu.

ft. and is a welcome addition to the ranks of small, sensible station wagons. Styling of the rear quarter, however, is not very appealing.



## Shoot the competition

The laser-beam speed gun being aimed by Mario Andretti during practice at Indy doesn't disable other drivers, it just gives an instant read-out of their speed. The instrument is



used by the Vel's-Parnelli Racing Team to check the speed of their competition and that of their own cars on the straights and through the turns.

Mario hit the wall during the 500 and didn't finish the race, but he just (at this writing) won the SCCA/USAC Formula 5000 race at Mosport, Ont., and he placed fourth in the Swedish Formula One Grand Prix to log his first points in the World Driver Championship standings.

## Toy transportation



Getting there is half the fun, but you might think twice about taking public roads if you're driving either one of these electric vehicles. The first all-electric kart is called Taboo II and is \$500 from Electric Fuel Propulsion dealers. Write to EFP at 366 West Eight Mile Rd., Detroit, Mich. 48220.



The Runabout, circa 1910, is a half-scale replica that's 79 inches in overall length. The chassis is welded steel, tires are pneumatic, drum brakes are on the rear and transmission is automatic. A not-too-big adult or not-too-small child can drive the car comfortably from the adjustable single seat. It's \$3750 from Hammacher Schlemmer, 147 East 57th St., New York, N.Y. 10022. \*\*\*



Even if you "don't know a thing about cars," here's an easy way to...

# Save over \$7500 this year on car expenses!

The new Can-Do Tune-Up™ Guide from Howard W. Sams strips away the mysteries of auto tune-up and maintenance with an easy-to-understand manual and first-of-its-kind Mechanic-on-Cassette!

How many times have you paid a mechanic to make a simple repair that you could have made quickly and inexpensively with just a little knowledge and a few simple tools? Well, now you can do your own car maintenance and tune-ups with the unique Can-Do Tune-Up Guide!

**See for yourself just how easy it really is!**

The Can-Do Tune-Up Guide is an informative 96-page manual especially designed for your car's make and year. It takes you through all the parts and systems of your car so you understand how and why it runs before you ever open the hood!

When it comes time for you to do the actual repairs, you'll use this informative book, plus the exclusive Mechanic-on-Cassette!

**Hear detailed step-by-step instructions on tape... while you work!**

No guesswork here. Clear concise instructions—recorded on easy-to-use cassette tape—picks up where other "fix it yourself" car manuals leave off. You'll find out how to clean and replace your spark plugs... check your lighting and cooling systems... and much more to help keep your General Motors, Chrysler, Ford, Toyota, Datsun, or Volkswagen car running in top shape for years.

**Order today and get special bonus section!**

Send for your Can-Do Tune-Up Guide today! As a bonus, you'll receive a special section—"Trouble-Shooter's Guide" to help you analyze and repair any mechanical failure you might encounter while driving. It's yours as part of the unique Can-Do Tune-Up Guide!

FREE catalog... loaded with over 400 additional books. Just check catalog box on coupon to get your copy.

**Keep each complete book/cassette combination for only \$7.95**

**CUT OUT AND MAIL THIS COUPON TODAY!**

103

## SEND FOR THE COMPLETE CAN-DO TUNE-UP GUIDE NOW!

☐ **YES...** I want to save money doing my own car repairs quickly, easily and economically. I am enclosing \$7.95 plus 45¢ for postage and handling. Please send me the Can-Do Tune-Up Guide, including the Trouble-Shooter's Guide, and the exclusive Mechanic-on-Cassette—specifically designed for my car make and year.

Name \_\_\_\_\_

(PLEASE PRINT)

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_ Zip \_\_\_\_\_

Include sales tax where applicable. CCO8

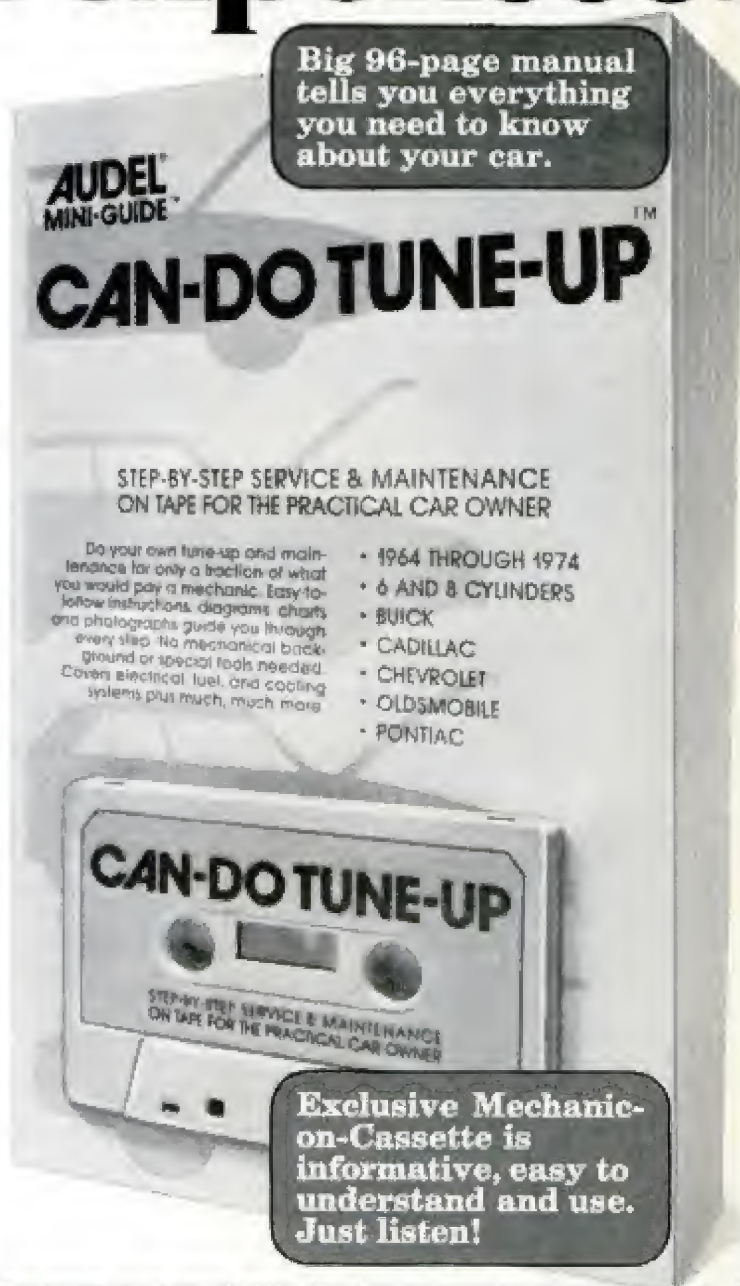
### Please check car manufacturer:

- |  |   |
|--|---|
| <input type="checkbox"/> General Motors<br>(1964-74) 23824 | <input type="checkbox"/> Ford<br>(1964-74) 23827            |
| <input type="checkbox"/> Chrysler<br>(1964-74) 23825       | <input type="checkbox"/> Pinto & Vega<br>(1971-74) 23831    |
| <input type="checkbox"/> Volkswagen<br>(1964-74) 23826     | <input type="checkbox"/> Toyota & Datsun<br>(1964-73) 23835 |

Please indicate year: 19 \_\_\_\_\_

- ☐ I want to receive the free Howard W. Sams catalog of over 400 "how-to" books. (07146)

**CLIP OUT... MAIL TODAY TO: Howard W. Sams Co., Inc./4300 W. 62nd Street/Indianapolis, Indiana 46206**



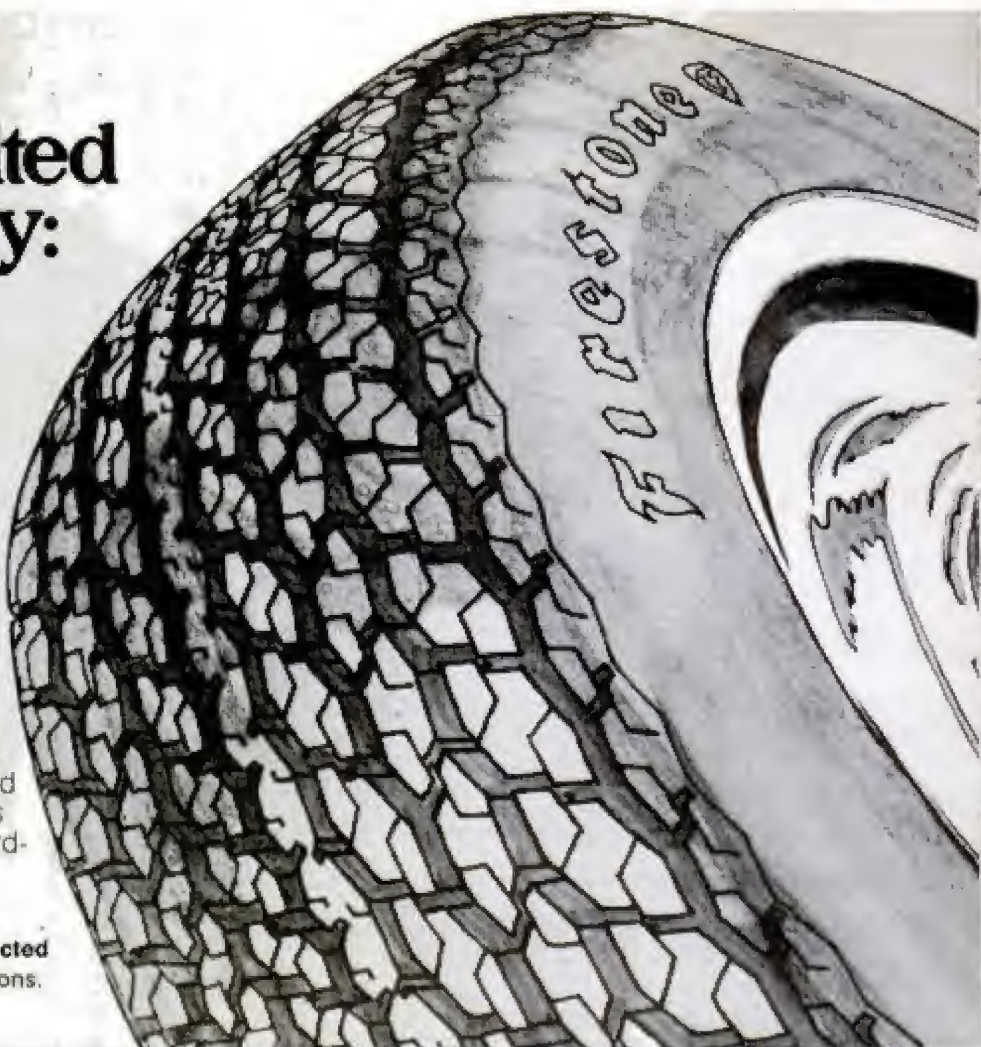


# How to decide which steel belted radial tire to buy:

## 1. Ask your Firestone Dealer about the Steel Radial 500.™

He'll clear up any questions you have about which radial has what by offering you the test data that earned this tire the name Gas Saver. By offering to let you drive on them for seven days and get all your money back if there's anything you don't like. By showing you how Firestone's Water Squeezer Tread keeps more rubber\* on wet roads. By showing how Firestone puts steel between you and tire trouble\*. By reminding you that this is the 40,000 mile tire you want for your hard-earned money.

\*Don't forget—the safety of your tires is also affected by air pressure, wear, load, and operating conditions.



## NOISE REDUCERS AT WORK

(Continued from page 83)

series to add to existing hi-fi systems and they're built into most high-end cassette machines (and some moderate-price ones) and into several FM tuners and receivers, a few open-reel recorders, and one or two pre-amplifiers and amps. Decoders for dbx are only available from dbx, but receivers and other components with built-in dbx are reportedly coming.

Once you have a decoder for either system, what can you decode? Your own tapes, of course—but there's more. Most commercially recorded cassettes are already encoded with Dolby B noise reduction during manufacture; many commercial open-reel tapes—chiefly classical—are made that way, too. Over the years, FM stations (100 of them, at this writing) have begun broadcasting with Dolby B encoding, too.

Here, there's even less of a compatibility problem, because stations broadcasting with Dolby B now cut back on the high-frequency boost they normally add to their signals (and which FM sets automatically compensate for) just enough to offset the sharper sound of undecoded Dolby. The newest FM tuners and

receivers with Dolby built in now adjust automatically for both the normal (75  $\mu$ sec) and special Dolby (25  $\mu$ sec) treble equalizations. For other setups, inexpensive add-ons are available from Switchcraft.

Records aren't available with Dolby encoding—but are available with dbx encoding, from a California label called Klavier, from Stan Kenton's Creative World jazz label and from others soon.

These dbx-encoded discs have to be heard to be believed. Imagine hearing the usual clunk as you set the stylus down into the lead-in grooves, then hearing utter silence (even with your ear up to the speaker) until the music starts. The dbx system can't entirely eliminate clicks and pops due to defects on the disc, but even these are minimized.

Closed systems such as dbx and Dolby, which require encoding and decoding, are as much for noise prevention as for noise reduction: They keep a signal from acquiring more audible noise in recording, but do nothing to banish noise already in that signal. To clean up that noise there are "single-ended" systems requiring no special signal pretreatment in recording.

Like Dolby, these take advantage

of sound masking: Since noise is only audible when there is no signal of similar frequency to mask it, then cutting the system's high-frequency output when there's no high-frequency signal will keep troublesome hiss from getting through.

The Burwen Dynamic Noise Filter and the Philips DNL system now used by Uher in its new CG-320 and by Nakamichi in its Model 1000 (which also uses Dolby, since the two do different things), work just this way. I haven't heard recent DNL circuits, but I have heard the Burwen, which works well but requires very careful control setting to keep it from being heard in action on some types of music signal, and to keep high frequencies from disappearing.

Phase Linear's more elaborate Autocorrelator sorts out high frequency tones we want to hear (overtones of the music's fundamental notes) from undesired highs of random noise that correspond to nothing in the music, opening a series of high-frequency gates to pass only the desired highs. My listening tests so far show the system to work exceedingly well, without detectable side effects, and with no control fiddling needed after the initial setup.

Pioneer's new RG-1 system is ba-



sically an expander: It makes signals above a given level proportionately louder, while signals below that point (mostly noise, if you set that point correctly) get softer; the degree of expansion is adjustable.

Single-ended noise reduction systems like these require complex, sophisticated circuitry. But as new techniques, such as integrated circuits, make such systems far more practical, we'll see more of them.

All noise-reduction systems, though, are simply crutches needed to support recording or transmission systems that aren't quite good enough by themselves. Already there are some systems, such as 15-inch-per-second open-reel recording that need little such help in home use. There will be more such systems as time goes on. Single-ended systems will still be used, of course, to clean up old recordings.

But eventually, I think we'll switch to digital recording (already being tinkered with for studio use); digital systems, which record a train of pulses representing the signal numerically instead of an electronic model of the signal, are immune to noise. But whether that will be five years away, or 10, or more is anybody's guess. ★★

## HOME ENERGY-SAVING IDEAS

(Continued from page 59)

basement or separate furnace room.

■ Cuts down on noise inside the house.

■ Removes a possible fire hazard from within the house.

■ Permits your serviceman, who would have a key to the heating-cooling module, to make repairs even when you are not home.

Though this type of system can be found in apartment buildings and big stores, it has never been made available to the individual homeowner.

"Now that the name of the game is the conservation of energy, this type of thing will surely come," says Szymanowski. "In time, the homeowner will be able to buy a module that is simply bolted to the house."

The house is impressively stingy with water. Drinking water is collected from the roof and run through a charcoal filter. Water for washing clothes, dishes and people is contained in a closed system and is used over and over. Water for flushing the toilet is in another closed system.

"What you really have in any house is three different qualities of water," says Szymanowski. "The toilet is a prime source of water waste. You

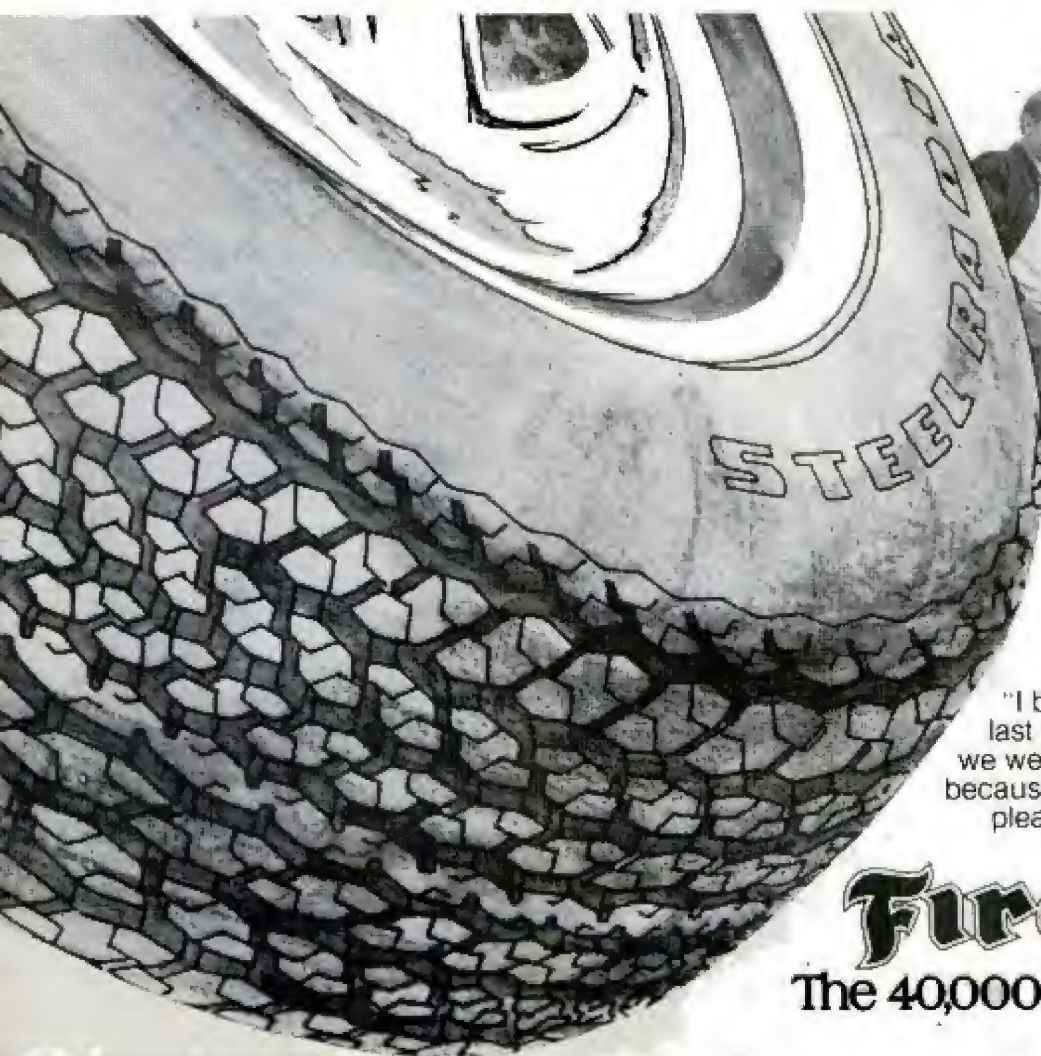
contaminate five gallons of pure drinking water with a few ounces of urine. Then you flush the lot away."

In Homelab, the toilet flushes into a steel tank in the basement. Injected air supplies oxygen, which stimulates bacterial action that breaks down solids. Liquids pass into another unit where they are treated with ozone to remove color and odor and kill bacteria. After passing through a carbon filter, the water gets a squirt of chlorine before it goes into a tank from which the toilet is supplied.

Szymanowski thinks the sewage system could be made competitive with the conventional septic tank system, but he says the wash-water setup would make economic sense only in apartment houses.

Homelab is full of surprises: a gadget that uses heat from the refrigerator coils to warm water for coffee or tea; plastic staircase treads that look like oak but promise to be cheaper; an advanced security system that uses seismic sensors to trigger an alarm.

But nothing is permanent in Homelab. "When a better method or product comes along," says Szymanowski, "we rip out the old and try the new. Otherwise, we'd have a museum, not an experiment." ★★



## 2. Ask a friend about Firestone.

"I bought a set of Firestone radial tires last year for my station wagon because we were planning a trip to California. And because I hate to change flat tires. I'm very pleased." **Bill Melvin, Perrysburg, Ohio.**

# Firestone

The 40,000 mile Steel Radial 500.



# Omega Pro-Lab B66

The last word in medium-format enlargers.

For sheer ease of operation, no photo enlarger surpasses Omega's Pro-Lab B66 for 35mm and 2 1/4" negatives.

The spring-loaded negative carrier opens wide when you lift the lamphouse, letting you advance negatives without disturbing their alignment. The lamphouse assembly is counterbalanced for smooth, easy movement. And a sliding panel allows instant access to the lamp, condensers and filter drawer. The

rigid, inclined girder keeps negative and baseboard perfectly aligned, and leaves maximum room to center your easel.

CARRIER OPENS EASILY

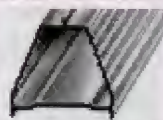
SLIDING FRONT PANEL

Yet the whole unit will come apart quickly and easily for storage.

The B66 comes with three condensers, for optimum light distribution with negs to 35mm; or switch to two condensers to match the 2 1/4" format optical requirement. Or get the optional dichroic color head and dial in the exact filtration needed for color or variable-contrast printing.

Priced as sensibly as it's designed, and for even greater savings, there's our "Two-Lens Outfit" for 2 1/4"-square and 35mm formats.

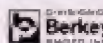
Write for literature to: Omega Division, Berkey Marketing Co., Inc., Woodside, N.Y. 11377. In Canada, Berkey Photo (Canada) Ltd., Ontario.



RIGID GIRDER DESIGN



OPTIONAL COLOR HEAD



Ω OMEGA

The Greatest Name in Your Darkroom.

Konica won't let those once-in-a-lifetime shots get away.



Those once-in-a-lifetime shots are here one moment, and gone forever the next.

Which is why you should be there with a Konica automatic camera. It lets you squeeze off a perfectly exposed shot that will capture a moment forever, instead of letting life pass by while you're busy setting exposures.

Konica is the world's most experienced maker of automatic 35mm cameras, and offers you more features for the price, whether you want to spend under \$100 or over \$1000.

Let your dealer help you choose the right Konica for you. Or write for literature to: Konica Camera, Woodside, N.Y. 11377.

**The Konica Automatics**  
From under \$100 to over \$1,000.



## PHOTO HINTS

### FROM READERS

#### Coin purse protects filters



Small plastic squeeze-type coin purses can protect your filters and close-up lenses from damage in your gadget bag. You can label the purses with label-gum tape, or buy purses in several colors to signify which filter or accessory is in which.—Charles F. Dayton, Akron, Ohio.

#### Organizer for your gadget bag



A scrap of perforated hardboard cut to fit your bag can end the jumble of small accessories and film cans that usually swirls around the bottom of the bag. First figure out the best place in the bag for the board, and cut it to fit there. Then shift the items you want to mount till you find the arrangement that holds the most in the least space, and fasten them in place with strips of 1/8-in. elastic from a sewing-notions counter. When you cut the elastic, leave enough to tie the ends together in a loop that will fit the accessory but hold it snugly. Some accessories may take two or three loops.—Gary Cosand, San Bernardino, Calif.



## DRIVING SUBARU'S 4WD WAGON

(Continued from page 75)

sand and really steep grades that no 2wd car could handle. Loose sand up to its hubs did slow the wagon, but we made it through. Likewise, I drove up and down some motorcycle jumps that no car without 4wd could scale.

On the freeway at 55 mph in 2wd, there's no gear noise. Ride feels as comfortable as in any subcompact. In 4wd on dry pavement, there's a slight gear whine and a tiny bit of howl from the heavily ribbed tires. I've heard worse from bigger 4wds.

The Subaru Super Star 4wd uses Fuji's conventional 1400-cc opposed Four engine, and I found the wagon a little underpowered for really rough going. I understand there's a 1600 in the works for next year. Also being considered is an automatic transmission for the 4wd, as is Subaru's five-speed manual. And naturally there's no reason why other body styles—the Subaru sedan and hardtop—can't be converted to 4wd, too.

This 1400-cc engine tends to bog down on fast acceleration, especially at low rpm. You have to keep it wound up pretty tight. Sweeping right-hand bends, such as freeway entrances, cause some cutting out, probably because of carburetor slosh. But the wagon did manage 24.7 mpg in all sorts of driving, so it's certainly one of the most miserly 4wds around.

Miscellaneous things I feel merit comment are the Subaru's overall workmanship—very good in my opinion—and the independent rear axles, which make for less unsprung weight and probably improve cornering, traction and ride. Base price of the 4wd Subaru wagon is \$3999 p.o.e., and there's a waiting list. ★★★



Overall workmanship is good; interior is nicely appointed. Four-wheel-drive lever is on floor ahead of stick shift.

# The good jobs are in Air Conditioning, Refrigeration and Heating...NRI can teach you at home to qualify for a career in this fast growing industry!

Climate control is the boom industry of the 70's, and the need for trained servicemen grows daily. NRI can give you that training, with its Air Conditioning, Refrigeration and Heating Courses. You study at home, in your spare time, with easy bite-size lessons that let you learn step-by-step.

## Window Air Conditioner Kit comes with Course for Trouble Shooting.

You get a Circuit Demonstrator, Control Simulator, tubing and joint-making demonstrator, leak detector, system analyzer, and a window air conditioner unit for hands-on experiments. A complete package for practical training at home.

## Optional Resident Training at Famous York Institute

Graduates of the Master Course may take advanced work at the York Institute Resident School. You do not have to attend to graduate...this is an optional extra at no extra charge.



Send the coupon today... for free full-color catalog. No salesman will call.



**NRI SCHOOLS**  
McGraw-Hill Continuing Education Center  
3939 Wisconsin Avenue,  
Washington, D.C. 20006

513-085

Rush me the NRI Catalog checked below. I understand NO SALESMAN WILL CALL.

☐ Air Conditioning and Refrigeration

☐ Master Course in Air Conditioning, Refrigeration & Heating

Name \_\_\_\_\_ Age \_\_\_\_\_  
(Please Print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

☐ Approved for career study under GI Bill. Check for facts.

Accredited Member National Home Study Council





BY EUGENE A. SLOANE



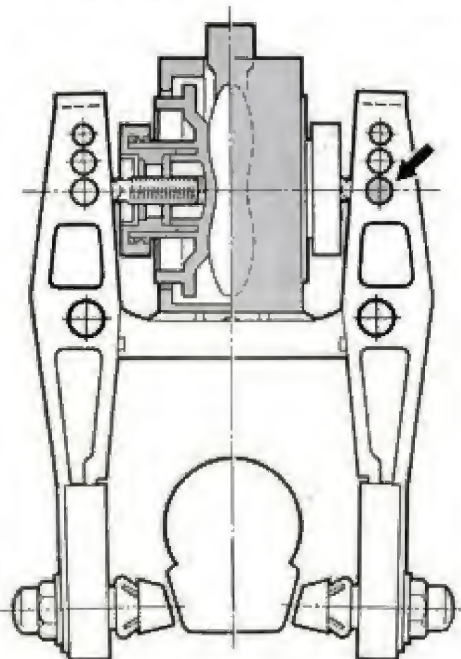
# THE BICYCLE SHOP

GENE ANSWERS READERS' QUESTIONS THIS MONTH

## Fluid stopping power

*I heard that someone is developing a new type of bicycle hydraulic brake. Can you tell me about it?—Charles Adams, Ames, Iowa.*

A new hydraulic brake has been



introduced by Williams Hydraulic Brakes, Elk Grove Village, Ill. 60007. I have not tested these brakes extensively as yet, but the manufacturer claims they exceed by 40 percent the proposed stopping power standards of the federal Consumer Products Safety Commission. The dual-caliper hydraulic brake will stop a 190-lb. rider in about 11 ft. from 15 mph, as compared with the proposed federal requirement of 19 ft. The Williams brake is being made for Murray-Ohio and will appear on Sears bicycles this year.

The arrow in the illustration above shows a nice feature, an adjustment point that allows you to apportion braking force between front and rear brakes. I did briefly ride a bike equipped with the Williams brake, and on the basis of this short test can report smooth brake operation and firm stopping power, all with one lever controlling both front and rear brakes.

## On flange height

*What is your advice on high-flange versus low-flange hubs, for general*

*bicycling and some touring?—Barry Knapp, Boulder, Colo.*

High-flange hubs were originally designed to provide maximum transmission of muscular energy to forward movement of the bicycle. High-flange hubs use shorter spokes, give less distortion but a stiffer, harder ride. Owing to their popularity with the European racing fraternity, these hubs have appeared on non-racing bikes exported to the United States and on U.S.-made 10-speeds.

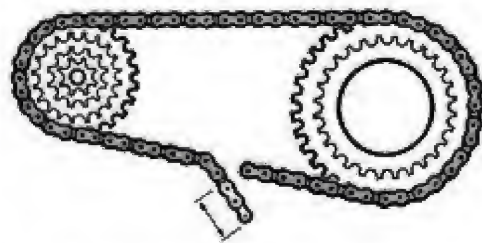
I much prefer low-flange hubs, which permit use of longer spokes, and I lace mine cross four, allowing even more spoke length. This combination makes for a more flexible wheel and a softer ride. You may not need a soft ride for short trips, but when you're on that bike for five to eight hours on long trips you definitely will appreciate it and the resulting reduced fatigue.

## Rocky-crossing gears

*My chainwheel has 44-52 teeth, my freewheel 14-28 teeth. These are okay here, but I want gears so I can cross the Rockies.—Bill Neubauer, North Tonawanda, N.Y.*

Keep the chainwheel, but change the freewheel to a 14-34-tooth cluster. I prefer the Shimano alternate-tooth freewheel, which makes shifting to the lower gears easier. Chances are, you'll also have to change to a rear derailleur that will handle the added teeth. I suggest the Shimano Crane GS wide-range derailleur.

You will also have to add one or two chain links of the same make



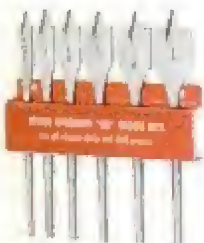
chain, as shown in the drawing, so when the chain is on the front 52-tooth and rear 34-tooth gears the derailleur is taken up almost parallel to the chain, for correct tension. Remember to adjust derailleur travel stops so the chain stays on outer gears. ★★★

**Fast, clean accurate boring in 17 sizes 1/4" to 1 1/2"**

Irwin Speedbor® "88" bits are Hollow Ground to bore cleaner, faster at any angle

Now step-up the boring range of your small electric drill or drill press to 1 1/2" with Irwin Speedbor® "88" wood bits. 1/4" shank chucks perfectly. No wobble. No run-out. Sharp cutting edges on exclusive hollow ground point start holes faster, let spade type cutters bore faster. You get clean, accurate holes in any wood at any cutting angle.

Each Irwin Speedbor "88" is forged from single bar of finest tool steel. Each is machine-sharpened and heat-tempered full length for long life. 17 sizes, 1/4" to 1 1/2". Buy singly, or in sets, at your Irwin hardware or building supply dealer.



Speedbor "88" sets. 6 and 13-bit sets in metal storage rack. 4, 6 and 13-bit sets in red plastic roll.

## Irwin Screw Starter.

Marks hole, starts hole, threads hole for screw to easily enter wood and non-metal materials. Handiest tool in years for home and job. Get one soon.



**IRWIN®**

every bit as good as the name at Wilmington, Ohio 45177, since 1885

**USE ZIP CODES WHEN ANSWERING ADS!**

**MOLDS**

for making Ornamental Concrete Items...

Book about Aluminum Molds with prices and production trade secrets direct from world's largest mold manufacturer.



SEND \$3.00

CONCRETE MACHINERY COMPANY, INC.

P. O. BOX A99 - HICKORY, N. C. 28601





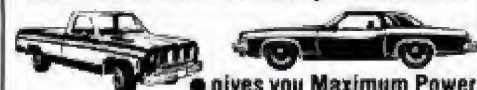


# ALLISON 'OPTO-ELECTRIC' The BEST...the ULTIMATE of ALL Ignition Systems!



• (We challenge ANYONE to dispute this Fact!)

Never wears out or needs any Maintenance!



gives you Maximum Power with continuous PEAK PERFORMANCE

...while reducing Maintenance and Operating Costs!

★ The Allison OPTO-ELECTRIC System eliminates the Points and Condenser, replacing them with an OPTO-ELECTRONIC TRIGGER, using a Light-Emitting Diode and Photo-transistor. The System operates on a beam of Light. As there are NO moving parts in rubbing contact, "Friction-wear" is completely eliminated. Timing adjustments are PERMANENT.

● Gives 40-Times more Timing accuracy than ANY system using "Mechanical" Breaker-Points! UNLIMITED RPM! "Electronically-Controlled" DWELL automatically supplies HIGHEST Performance at both Low and High speeds. Spark strength does not fall off at high RPM. POSITIVE SPARK helps eliminate "Misfire" for faster acceleration and improved Engine Performance. Sparkplugs LAST 3 to 10-Times LONGER.

● Easier Starting under any condition! Smoother running... (NO TIMING FLUCTUATION as with Magnetic Impulse Units). All SOLID-STATE Components UNAFFECTED BY Temperature, Moisture, or Vibration! Only Highest grade materials used. Guarantees you Solid, Dependable Performance!

● PERFECT TIMING INCREASES Engine Efficiency and Gas Mileage. SAVES Precious Fuel! Allison gives you MAXIMUM Engine Efficiency 100% of the Time... and that's the name of the game for the BEST in GAS MILEAGE AND ECONOMY.

★ Perfect Timing and Dwell never change.

● Pays for itself! Eliminates ignition Tune-Ups forever! "INFINITE LIFE" Once installed...Never needs replacing!



★ PROVEN RELIABILITY!  
Each Unit Tested to 15,000 RPM.

● Road and Race Proven.  
(Opto-Electric Systems won at INDY Two years in a row!)

★ "EASIEST-TO-INSTALL" UNIT ON THE MARKET.  
(Not necessary to dismantle Distributor as with other systems)

★ If you want the BEST, and SAVE! This is IT!

ORDER WITH CONFIDENCE...  
SATISFACTION GUARANTEED  
...or Full Refund.

10-YEAR FACTORY WARRANTY!  
(Free Repair or Replacement).

● Send Check or M/O (Call Res. add Tax).

State Make, Year, Engine Size, (4, 6, or 8-Cylinder).

★ (So New...It's Sold ONLY FROM FACTORY DIRECT).

● You may use your MASTER CHARGE or BANKAMERICARD. Send us (1) Your Number, (2) Interbank No., (3) Exp. Date.

M/C or B/A Card Holders, ORDER by TOLL FREE PHONE: (800) 423-8525, Ext. 2 (When in Continental U.S.A.)

And YOUR ORDER will be SHIPPED IMMEDIATELY.

★ Before buying any other Type Ignition system...

Send Postcard for our FREE BROCHURE.

★ If you have already installed a C-D ignition system, Modernize and increase its Efficiency... CONVERT YOUR "C-D" UNIT TO BREAKERLESS! Opto-Electric "TRIGGER UNIT"...Only \$34.95

● Our BEST Salesmen are the users of our ALLISON System!

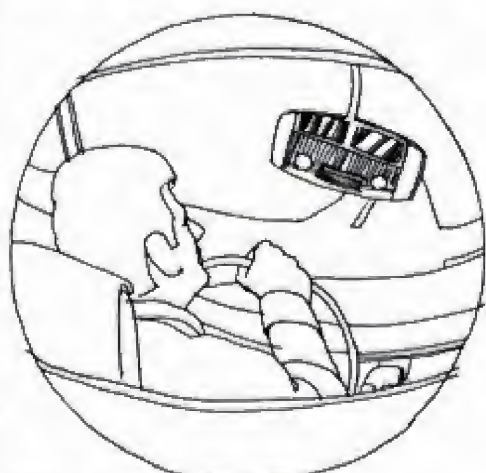
America's Oldest and Largest Mfg. of Opto-Electronic Ignition Systems.  
**ALLISON**  
AUTOMOTIVE COMPANY  
1267-X, East EDNA PL., COVINA, CAL. 91722

## HOW TO STAY ALIVE IN A SMALL CAR

(Continued from page 40)

road"—not any specific example or tip—that will save your life. A classic example of superior anticipation and judgment is the way Juan Manuel Fangio, one of the greatest race drivers of all time, saved his life driving an Alfa Romeo Grand Prix car at Monte Carlo in 1950. As he approached a dangerous corner at high speed, he noticed something different—no whitish blur of faces indicating that the spectators were watching him approach the corner. With no other sensory input on which to base a decision, he braked hard. Just around the bend was a pile-up of race cars; it was the pile-up that had turned the race fans' heads!

You'll never race on the streets of Monte Carlo, but you'll be driving in far more dangerous surroundings: the streets of your home town. Unless all your concentration is on your driving, there's no way you can exercise the anticipation and judgment that will keep you alive at the wheel of a small car. As soon as you become careless and sloppy, you leave yourself vulnerable to the unexpected ("He came out of nowhere!") that will do you in.



### Drive behind you

At any given moment you should know exactly what vehicles are behind you and what are their relative speeds. A vehicle overtaking you carelessly can involve you in an accident not of your making; if you have to brake or swerve suddenly, you'll be able to do so with consideration for the traffic behind and possibly avoid being rear-ended. Also, you should continue to check your rear-view mirror when stopped at a traffic light until all traffic behind has come to a stop. It doesn't matter that it's the other guy's fault if he hits you from behind—nothing matters if he kills you. If you can see what's bearing down on you from behind, you can take action to minimize the impact or escape altogether. If you see in time that you are going to be rear-ended you can accelerate ahead, pull over to the side or turn the corner, depending on traffic. Such a quick action may be something you never have to do, but even if you do it only once in a lifetime, driving with your rear-view mirror will have paid off.

Concentration is not a fatiguing, white-knuckled grip on the steering wheel. It is, in fact, an antidote to the fatigue and boredom that attacks drivers for whom driving is a chore. Concentration can become a good habit—so much so that you will be doing the right things "without thinking."

I had forgotten the degree of my own concentration until one night on a particularly dull stretch of road my 8-year-old daughter asked me a question. To her I was apparently hypnotized at the wheel, and she asked, "Isn't driving along here boring?" My answer surprised me.

"I'm too busy to be bored."

"Busy!"

"You can't see how busy I am."

"What are you doing?"

"Moving my eyes, listening with my ears, feeling with the seat of my pants."

I started to explain—itemizing everything I was doing:

"My eyes are in a continual scan or sweep that goes from the road just ahead, watching for fallen mufflers, other debris, broken pavement and so on; to the road farther ahead and the cars up there; over to the shoulders and the brush where I might see a deer, rabbit, cat or dog about to dart out onto the road; up to the rear-view mirror to check the positions of the cars behind; and then to the instruments that tell me how fast we're going, how much gas we have and if certain parts of the car are working properly. I have to speed up this scan when we are going faster. The fingers of my left hand are moving, too: switching on the high beams as necessary, and dipping them as I see the glow of headlights that tell me a car is coming over the next hill. I'm listening to the sound of the engine and feeling the vibrations of the car going over the road, always alert for odd sounds or shimmy or shakes that mean something is wrong."

I didn't go so far as to explain that a sudden failure in the 93,000-mile-old engine might result in a locking of the rear wheels and I would instantly have to depress the clutch pedal to prevent a skid! (Driving researchers say, and I believe it, that children start learning to drive at age two—by observing their parents at the wheel.)

Driving is a full-time activity, and you don't get bored or sleepy when you're concentrating on something you enjoy doing and doing well.

Love the challenge of driving skillfully. Stay alive. ★★



Get into...

# PLASTIC LAMINATING AT HOME!

Sensational New  
**"ONE MAN  
BUSINESS"**  
...pays \$10 to \$20 profit  
for each dollar of cost.

Make Up to <sup>\$</sup>12 an Hour by  
our **MAGIC MAIL PLAN**... get  
orders and cash from your mailman!

Here's the newest and most fascinating of all home-operated businesses. For the first time, a simplified machine brings the fabulous profits of Plastic Sealing and Plastic Laminating within the reach of the small operator. Can be

operated in a corner of the kitchen, basement, or garage. And any man or woman, regardless of age, education, or experience—can learn this interesting work in a few minutes of reading—can turn out professional jobs after one hour's practice.



## TWO EXCITING FIELDS FOR BIG PROFITS!

No house-to-house canvassing. No face-to-face selling. We not only supply the equipment you need for the work, but also show you exactly how to cash in big daily profits from two big demand fields.

### A FORTUNE IN PLASTIC SEALING

Millions of people want to protect valuable cards, photographs, documents and papers against wear, soil, and damage. By our MAGIC MAIL Plan you get this business through the mails. Open envelopes, take out money and orders. Details of plan will amaze you. It will be sent free. We even furnish financing help. Just mail coupon.

### ENORMOUS PROFITS IN LAMINATING

A creative, artistic business. Gift shops sell your entire output. Just a few of thousands of giftwares illustrated on this page. Beautiful colors. Endless designs. Exclusive "one of a kind" appeal brings sales at ten to twenty times the cost of materials. Beautiful illustrations and instructions for making these artistic novelties sent free.

**NO MONEY—**  
Just Send Name!

We'll even help with financing at less than bank rates!

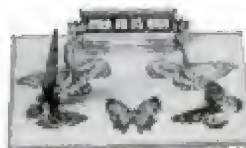
**WARNER ELECTRIC CO., Inc.**

1512 Jarvis Dept. L-2-EJ Chicago, Ill. 60626

The opportunities in Plastic Laminating are so big that space here does not permit even skimming the surface. To get any idea at all of the size of these markets and your place in this sensational business you must read the details. See for yourself how easy it is to do the work—how you can put plastic sheets into your machine and take out a fortune—how money and orders come to you in the mail—how gift shops clamor to get more and more of your creations—how you can start with one machine and build up a big production plant with others doing the work—how you can get money and business from every State in the Union—how you can achieve independence without study or experience.

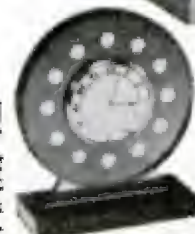
**FREE**

self how easy it is to do the work—how you can put plastic sheets into your machine and take out a fortune—how money and orders come to you in the mail—how gift shops clamor to get more and more of your creations—how you can start with one machine and build up a big production plant with others doing the work—how you can get money and business from every State in the Union—how you can achieve independence without study or experience.



**RUSH COUPON**

Never before has such an opportunity been offered the small, home-operator—an opportunity to gain complete personal independence in a big money business of your own. Don't lose a minute. Get the facts at once. All information, fully illustrated with pictures, is free. Send the coupon—or send your name and address on a postcard. There is no charge now, or at any other time. Send for the information on this exciting opportunity today.



### Cash Money Comes to You in the Mail

By our MAGIC MAIL Plan you sit at home, send out mail, and get back money and orders. Additional profits in supplying lifetime protection for **SNAPSHOTS—IDENTIFICATION CARDS—DISCHARGE PAPERS—DRIVERS' LICENSES—SOCIAL SECURITY CARDS—VOTERS REG. CARDS—MENUS—BIRTH CERTIFICATES—CREDITCARDS—BIRTH AND WEDDING ANNOUNCEMENTS—PASSES—DOCUMENTS.**

Lifetime protection. See how laminating prevents soiling, wear, and moisture damage with flexible, plastic covers.



## Thousands of Beautiful ART CREATIONS

Made by Laminating as explained in our Free information. Send coupon for list and pictures of **COSTUME JEWELRY—JEWELS—CIGARETTE BOXES—CUFF LINKS—NOVELTY BUTTONS—TRAYS—CANDLESTICKS—COASTERS—CLOCK CASES—LAMP BASES—PICTURE FRAMES—BOOK ENDS—CHARMS—ADVERTISING SIGNS—NAME PLATES—FISH LURES—CHECKERS—PAPER KNIVES—CHESSMEN—BOOKMARKS—TIE RACKS—KEEPSAKES OF ALL KINDS.**

**WARNER ELECTRIC CO., Dept. L-2-EJ**  
1512 Jarvis Avenue, Chicago, Illinois 60626

Please mail, postage prepaid, complete information with illustrations showing the things I can make and the money possibilities in Plastic Laminating. All free. No Salesman is to call. Also, tell me about your New Lower-Than-Bank-Rate Credit Plan and how I get orders and money by the MAGIC MAIL Plan.

NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_



FOR REALLY DIRTY HANDS...GET

# LAN-LIN

LAN-LIN gets down deep into skin crevices to get hands really clean! Quickly removes oil, grease, dirt, stain.



Rub on...Rinse or Wipe Off!

## LIQUID WRENCH

Regular (No. 1), the super penetrant that loosens rusted nuts, bolts and parts... in seconds!



## LIQUID WRENCH

New! (No. 2) stops squeaks, cleans and lubricates... protects metal parts. Dries wet engines. Protects against rust and corrosion.

## TRANSEAL

The original "dual-purpose" automatic transmission sealer and conditioner. Prevents and stops leaks in automatic transmissions... keeps seals soft and pliable.



## BEARIN' SEAL



Stops oil leaks in front and rear main bearing seats. Add to crankcase oil... mixes with all motor oils... will not harm engine parts. Stops oil drip and waste.

AT AUTO STORES EVERYWHERE

Write For Catalog

RADIATOR SPECIALTY COMPANY  
Charlotte, North Carolina 28237

## COPY YOUR SLIDES AT HOME... AND IMPROVE THEM

(Continued from page 67)

specifically for this task, it will give very good results.

Some duplicators attach the slide holder to the light box, not the camera. Since most reflex camera finders show you a little less than the film will see, setting up one of these duplicators requires an extra step: After focusing, but before loading your film, open the camera back and sight in with a "ground glass"—made of

2¼ x 2¼ slides. The setup is flexible—you can shift it and the camera independently to copy just a portion of a slide—but mark the "centered" position carefully, as the box is easy to shift accidentally.

If you're really going in for duplicating, you might consider the \$495 Bowens Illumitran, and the \$325 Honeywell Universal Repronar. Both have bellows rigidly mounted above



Overexposed, washed-out slides can be improved by making a slightly underexposed copy. Kodak's 2483 film will add contrast, deepen colors, for even more "punch."



Underexposed slides reveal unsuspected detail if an overexposed copy is made. As with overexposure, only mild corrections can be made—some slides are unsavable.

matte acetate, waxed paper, underdeveloped film or even real ground glass—that has been spread over the film opening.

Cheapest of the "light-box" duplicators is the Testrite-Kingdon, \$80, plus your bellows and a tripod or copy stand. It has a dim light for focusing, a 3200° K floodlight for exposure, and a filter holder consisting of a glass-and-plastic 2¼ x 2¼-inch slide holder (which eventually melts; get a glass-and-metal one). You can mount it upright or on its side, and there's a removable, 45°-angled white reflector and a coverable window so you can strap on your electronic flash instead. The 35-mm slide holder removes, too, for copying

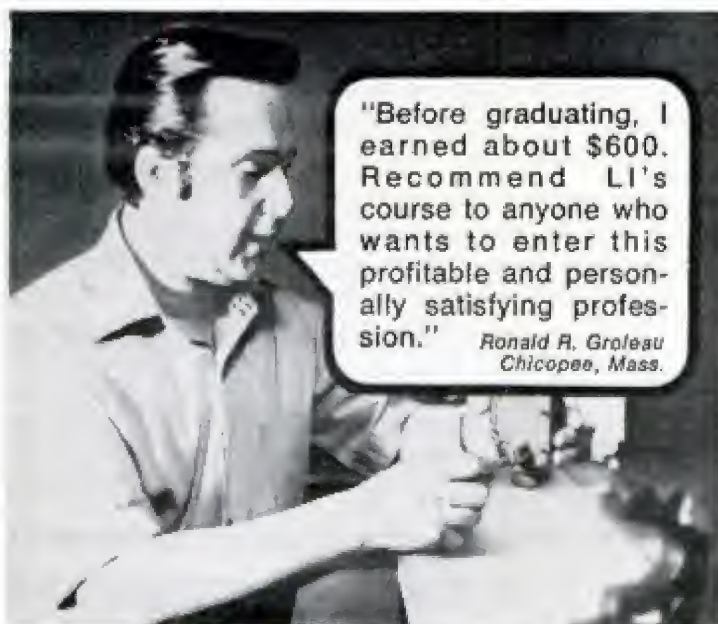
slide-holding light boxes that incorporate focusing lights, electronic flash units for exposure and filter drawers. Both have two, switch-selected flash-output levels, and the Bowens also has a variable dimmer plus a built-in light meter (the Repronar uses your camera's meter). The Bowens will also let you copy from negatives or transparencies up to 2¼ x 2¼ inches (to 4x5, with an accessory).

But the main ingredients won't be equipment: They'll be the sweat you put into your test rolls before you get your first good copies—and the satisfaction you'll get from copies better than the slides your originally shot. ★★★

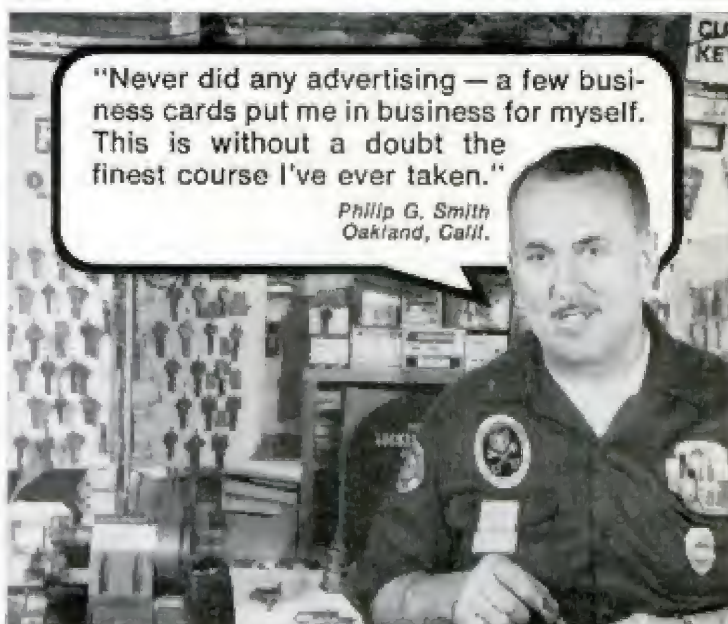


# HERE ARE REAL PEOPLE WHO BECAME REAL LOCKSMITHS!

Learning quickly, easily  
at home, from the one and only  
**LOCKSMITHING INSTITUTE**



"Before graduating, I earned about \$600. Recommend LI's course to anyone who wants to enter this profitable and personally satisfying profession." *Ronald A. Groleau  
Chicopee, Mass.*



"Never did any advertising — a few business cards put me in business for myself. This is without a doubt the finest course I've ever taken." *Philip G. Smith  
Oakland, Calif.*

**You can have equal success —  
Locksmithing Institute can be the key  
to a highly paid successful future!**

LOCKSMITHING is truly the "neglected profession." Opportunities for big cash earnings, spare time or full time, exist in all parts of the country. Almost regardless of age or education, even with minor physical handicaps, you can acquire professional status in an enjoyable trade where work is fun. You can be your own boss—in your own business!

Let us send you sample lesson pages, full details of the home training, and, most important, complete

information on the glorious opportunities for locksmiths now that the nation is so security conscious.

See for yourself the list of more than 300 parts, tools and pieces that we furnish with the course. All your files, tweezers, cylinders, assemblies, extractors, plus locks, keys and door handles are included—EVEN A FULL SIZE ELECTRIC KEY MACHINE with which you can make money at once.

Write today...no obligation.

## LOCKSMITHING INSTITUTE

Division of Technical Home Study Schools

Dept. 1110-085

Little Falls, New Jersey 07424

Licensed by State of New Jersey. Accredited Member National Home Study Council.  
State Approved Diploma. Approved for Veterans Training.



**NO OBLIGATION —  
NO SALESMAN WILL CALL!**

We'll mail you full information so that you can examine it, without obligation, in the privacy of your home, at your leisure.

### LOCKSMITHING INSTITUTE

Dept. 1110-085  
Div. of Technical Home Study Schools  
Little Falls, New Jersey 07424

YES, rush me your free "Opportunities in Locksmithing," plus full details on money-making opportunities, key machine and tools, sample lesson pages, tuition and easy payment plans.

Name

Address

City

State  Zip

☐ Check here for information on Veterans Benefits.



## BARGAINS IN LITTLE BOATS

(Continued from page 69)

sturdy and cost less to keep up. The lightness of marine aluminum is also an advantage when you're perching or loading up on a car roof rack. A hull of ABS plastic is usually well made because it takes larger, more expensive machines to heat-form it, and it can't be cranked out carelessly in someone's back yard. The smaller price of smaller boats often makes building and shipping them cross-country too expensive for a big boat company, so many are made locally. Ask friends and knowledgeable boatmen who own one about the builder's reputation.

### Power

Tiny craft come in so many shapes that it is hard to recommend the best choice of power. In order to row or paddle easily, the hull must be designed for rowing and paddling. Often an outboard motor or sail can be added, but a boat performs best when pushed along in the way it was intended. But since you may get tired of muscle work, it's usually best to

to match your modest budget, but the price for the good little model you've picked is \$500 instead of the \$50 you'd imagined? There still is hope if you consider some of the following cost-cutters.

If there is a special design you feel that you must have, consider building it. Plans and kits are available from a variety of sources, most are not difficult to construct, and there is the satisfaction of doing it yourself. Study and patience are as important as skill; some of the best homebuilts we have seen were made by owners who admitted they had flunked birdhouse building in shop class at school.

If you figure in your time (and the time is often twice your first estimate), the boat will cost you plenty. But if you put no price on your hours of work, you can build your boat at approximately half the expense of buying a new one.

You have no time or urge to build one for yourself? Consider buying it second hand. Small used boats are harder to find in classified listings, but are easier to locate on a boat or yacht club's bulletin board or by

word of mouth from boating friends, boat-yard managers and marine store workers. Walk along a waterfront and you're likely to spot some appealing "for sale" signs.

Want a boat for your vacation, but you aren't sure just what it should be? Often you can rent one from a boat shop or a friend and learn plenty while you're saving plenty.

Need a small boat for your summer camp on a river or lake? Frequently your next door camping neighbor also does. Check, and if his vacation falls at a different time, there is a good chance he may chip in half the price and share the boat on alternate weeks or weekends.

And if you can be patient, wait for a storm this fall or the end of the season and hauling-out time, particularly if you know something about the simple process of fiberglass repair. Often a banged-up boat can be as strong as new after some epoxy patching. Many a happy boatowner started out with a small craft with a hole in the hull—one he bought from its discouraged skipper. Your repair kit may be your key to going afloat right now. ★★★



For sailing action, pick a class that is locally popular, like these fast Force 5s.

pick the cockleshell that can be rigged with an auxiliary outboard motor. Even if you never use a motor, the boat is more valuable for resale if the transom is able to take an outboard, or a stern bracket for one.

Remember that adding a sail is not enough to turn a rowboat into a sloop. Your hull will slide sideways and the sail will try to tip you over unless you also add some form of keel or leeboards. A true sailboat is always easier to handle than a makeshift one.

### Added moneysavers

You'd planned to pick a small boat

## Small-boat buying guide

A little boat can cost a lot or be a bargain, depending on the questions you ask before you buy. Here are 10 key queries you should answer when you shop this year:

1. Is a small boat big enough? Many beginning boatmen endanger their families by selecting a model that will be overloaded once they pile gear, friends and kids aboard. Even on calm water, a 12-footer should probably hold no more than three or four.

2. Is it right for local waters? Look at other boats in use. An Eastern seaboard harbor with rocky shores, marinas, docks, can be handled by a rowing dinghy, for example. Pacific beaches with surf can be easier to reach with an outboard-powered inflatable. A skiff with low sides or a sailboat that cannot cut through chop will waste your money in areas where conditions are usually breezy or rough. The types of boats popular in your area are usually the best buys, and easier to resell later. Seaworthiness is essential in small craft as well as large.

3. Is it a boat, or really a toy? The price may be low because the boat belongs in a swimming pool and will break up or swamp if ever hit by a wave. Inexpensively made inflatables are sometimes in this class, and will puncture easily if given rough handling. Foam-hull craft should have a hard protective surface.

4. Is it portable? Little boats are handy and versatile because they are light to move around. If you find a bargain in a heavy old wooden skiff, be sure you won't

want to cartop it or need to launch and haul it every day.

5. Wood, plastic or metal? Quality of construction is more important than material. Wood requires more care, but there is no maintenance-free boat. Buy the one that is well designed and well made.

6. Is the boat suitable for several uses? Small boats need to be versatile. A dinghy may be used for fishing, water-skiing, makeshift sailing or as a duck boat. Multi-purpose features make a boat a better value.

7. Will it be resalable? Though you love the boat now, you will be disappointed if you find it does not keep its market value. Boatmen continually trade up and down.

8. Does it have plentiful flotation? Small boats are often overloaded and handled carelessly. Since they tip over more easily, it is important that the swamped boat can still support you and all gear. Ideally, it should be easy to turn upright.

9. Is it in good condition? Inspect both new and used hulls carefully. Be sure a used model has no hidden flaws. If in doubt, consult an expert.

10. Is the boat good-looking? If you don't really like the lines of a boat, you will be unhappy whenever you look at her. Boats should be beautiful.

Don't lower your standards just because a little boat costs less. It still has to give you pleasure and keep you safely afloat.



## PATIO PARTNERS

(Continued from page 94)

clear sealer intended for outdoor use.

### View divider

Garden grades of redwood—construction heart and construction common—are ideal for building this privacy screen. Use the former for posts and bottom stringer and the latter for all remaining parts. Posts are set at 4-ft. intervals; posts also flank each window. Since the width of each window is 15½ in., set the flanking posts 15½ in. apart or 19 in. on center. Plant posts at least 2 ft. in ground (or below area frost line) and anchor them in concrete.

Nail top and bottom stringers to posts and position the 2x4 stringer midway between. Finally, predrill holes in the 2x2 vertical members and nail them to stringers using a nail at each stringer. Fasten all members with 16d nails.

### Grille fence

Construction is similar to the previously described fence. Open lattice-work is spotted here and there in a closed fence to guarantee passage of cooling breezes. Build the lattice section as shown in the drawing on page 93.

### Post lamp

This design is particularly well suited for construction with clear Idaho pine followed by a stain to suit patio or entry decor. Construction of the lamp is easier than it may appear. Start by marking and nailing louvers and top pieces to the sides to create four units. After adding the 1x1 filler strips to inside edges of two of the louver units, secure units together by nailing through the filler strips. Next, toenail the four lengths of 2x2s into the four corners formed by the louver units. Fabricate the post, install in ground and slip in lamp. Collar of 1x3s at top of post and 1x3 strips below hold lamp assembly in place.

### Redwood planter

This is basically a simple box. Complete plans for building it are shown on page 93. Notice that the box design includes two different pairs of sides. Construction of redwood planters requires two basic precautions to make them maintenance-free. First, be sure to drill holes in, or leave narrow spaces between, bottom boards to assure adequate drainage. Second, use only corrosion-resistant nails and fasteners.

### Octagonal planter

The 18 courses that form the sides

of this planter are cut from nominal 2x3 cedar lumber. Measurements are easy—see the example of one length (A) shown for the top course. Measurements in the drawing are for the dimension shown in the example—that is, the short length between the 45° miter cuts at both ends.

To build the planter shown, you'll need 144 linear feet of lumber for the sides. Two galvanized 12d nails in each piece holds it firmly to the piece under it. Though it's optional, it would be wise to use waterproof glue. Vertical grooves at corners help to hide uneven cuts. Making them requires careful use of a portable cir-

cular saw and a tacked-on guide. Painting is not advised for this planter; rather, stain it to match house or patio. For simplicity, assemble pieces with planter upside down.

### Stained planter

Basically a box, this planter can be made of either construction grade (knotty) or clear pine. As seen in the construction drawing, a second box is created on the inside to receive the plant container. This box, of course, can be sized to suit the plant of your choice. If desired, a shelf can be added here to raise the pot height. ★★

## What makes Johnny run.



## What makes Johnny stop.



Found wherever plumbing products are sold.

FLUIDMASTER, INC.  
1800 Via Burton  
P.O. Box 4264  
Anaheim, Calif. 92803



Clean spark plugs can save you 1 to 2 gallons of gas per tankful!

## TURBO-BLAST

Amazing New Spark Plug Cleaner

SAVE GAS AND GET UP TO 50,000 MILES ON YOUR SPARK PLUGS

- ★ Rugged 12,000-RPM motor—plugs into any household outlet
- ★ No compressed air or batteries
- ★ Comes with glass bead abrasive to clean 250 plugs. Additional beads available.

Cleans any plug in seconds!



JAYCRAFT CORP. DEPT. PMS  
760 North Marshall Ave., El Cajon, CA 92020

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_  
State \_\_\_\_\_ Zip \_\_\_\_\_

**\$19.95** plus \$1.55 shipping & handling. California residents add state sales tax.

SATISFACTION GUARANTEED or return within 30 days for refund

Let Belsaw prove **YOU** can  
**Earn Up To \$800 an Hour**

In YOUR OWN SPARE TIME or FULLTIME



## SHARPENING BUSINESS!

On our 30-DAY FREE TRIAL OFFER

You risk nothing by accepting this offer to see how easily you can turn your spare time into big Cash Profits with your own Complete Sharpening Shop. No selling... no previous experience needed. Our famous Sharp-All and show-how instruction set you up to make \$200, \$500, \$700 a month CASH sharpening Saws, Knives, Scissors, Lawnmowers, Shop and Garden Tools... all cutting edges.



Send for all the facts! Our Free Book tells how to start a profitable, lifetime home sharpening business, how we help you grow, how we'll finance you.

LIFETIME SECURITY with YOUR OWN BUSINESS

FREE BOOK! Gives Full Details

BELSAW SHARP-ALL CO., 716P Field Bldg., Kansas City, Mo. 64111

No Obligation...No Salesman Will Call

YES, ☐ BELSAW, 716P Field Bldg., Kansas City, Mo. 64111 please send me the FREE BOOK that gives full details.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City/State \_\_\_\_\_ Zip \_\_\_\_\_

# inventors

...Manufacturers Need New Products

If you have an idea for a new product, or a way to make an old product better, contact us, "the idea people." We'll develop your idea, introduce it to industry, negotiate for cash sale or licensing.

Send for our FREE "Invention Kit." It has a special "Invention Record Form," an important brochure, "Your Invention—Its Development, Protection & Marketing," and a Directory of 500 Corporations Seeking New Products. You'll learn how ideas become a reality!



RAYMOND LEE ORGANIZATION  
230 Park Ave. No., New York, N.Y. 10017

I'd like to find out how to take action on my idea. Send Free "Invention Kit No. A-12"

Name \_\_\_\_\_ Please Print  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
SAN FRANCISCO LOS ANGELES TORONTO VANCOUVER DENVER CHICAGO



**GARAGE OPERATOR...\$9995!**

- ★ RADIO CONTROLLED from car transmitter or wall switch
- ★ SAFETY night and day year 'round
- ★ SECURITY door locks right when closed
- ★ CONVENIENCE in car control any weather
- ★ LIGHTING garage lights automatically
- ★ VERSATILE fits all lifting type wood, metal or fiberglass doors sectional and 1-piece
- ★ EASY HOME INSTALLATION in just 2-3 hours
- ★ SAVE up to 50% direct factory purchase and PP or UPS home delivery
- ★ GUARANTEED one year
- ★ FREE brochure

HELPMATE Equipment Co., Box 51 PM Baroda, MI 48101

## AAMCO® And You Can Make It!

The world's largest transmission chain is still growing strong after eleven years. Over 500 of our franchises located from coast to coast. New openings in some markets mean you too might qualify. For further information write:

AAMCO Transmissions, Dept. 816  
408 E. Fourth St., Bridgeport, Pa. 19405

## GEM-CRAFT KIT



Complete Cabochon Diamond Compound Sanding/Polishing Kit to Fit your 1/4" Drill **\$19.95 ppd.**

Everything you need for sanding and polishing gemstones as the professionals do. Includes 2 sanding discs, 4 polishing discs/w pads, 6 syringes of diamond compound, extender fluid, compound roller, glue, sandpaper, shaft adapter and shank to fit 1/4" drill with instructions. Send check, M.O. or charge no.

RAN-CO Lapidary Products

19015 Parthenia St. — Northridge CA 91324



**BUILD THESE BEAUTIFUL CLOCKS**



**NOW AT BIG SAVINGS!**

Send just \$1 for plans & instructions to build choice of: (A) Grandfather, (B) Steeple, (C) grandmother—plus information-packed catalog of movements, dials, parts & kits to build these & 16 other fine clocks. All 3 plans—\$2.50. Catalog alone—25¢.

MASON & SULLIVAN COMPANY  
Dept. PM Osterville, Mass. 02655

## PORT FOR PEAK PERFORMANCE

(Continued from page 89)

powerpack output curves and ignition patterns of the secondary voltage while engines are actually mounted and running offshore.

Unique among test craft is a 30-foot creation with dual inboard engines port and starboard and a special transom-stress plate amidships for mounting an outboard motor. Clamped in place, the outboard's thrust and drag can be measured, torque curves plotted, propeller efficiency computed at various speeds. A forward cockpit seat is used by the driver plus one passenger, while in the rear cockpit, two engineers can record dynamometer measurements in pounds of thrust and drag from the load cells of the mounting plate.

Oversize speedometers give simultaneous readings, one for zero to 30 mph and a second covering 20 to 60 mph. Even the trim of the dyno boat is shown so corrections in readings can be introduced according to the measurement of incline caused by engine weight. Intercom headsets between driver and back-seat engineers allow coordination of the dyno boat's speed from internal engines and thrust of the test outboard as varied from its rear control panel.

Test-base facilities allow the 150 to 200 boats usually available to be moored at slips for immersion and static testing, or launched by overhead hoist, test run offshore, lifted out again immediately and brought by overhead railway into the machine shop for instant adjustment. At this test base factory-team racing setups are perfected; their wins over recent years have helped make possible the big new outboards reported ready to join OMC lines next year.

To check some of the hottest rigs, we joined two frequent test-base visitors, engineers Ralph Evinrude, board chairman of OMC, and former MIT professor and racing driver Charles Strang, OMC president, to form one of PM's more impressive test teams. Speed from several outboards left no doubt that under some hoods were bigger muscle prototypes. Their performance pointed out neatly how outboards are adding power without increasing in size or noise. Finally, we wake-jumped a Glastron, Boston Whaler and Slickcraft from among the base's favorite test models, while drivers Evinrude and Strang ran the chase boat. Ralph Evinrude had been the first ever to jump a boat for newspaper photos, in 1926. Getting better performance is still the name of the game. ★ ★ ★



# GET RICH SLOWLY

with the help of U.S. News & World Report's  
**MONEY MANAGEMENT LIBRARY.** Start by reading  
**"What Everyone Needs to Know About Law" free for 10 days**

The world is filled with get-rich-quick schemes. Most of them, alas, don't work—and cause unwary investors to lose millions of dollars every year.

But there are many excellent and completely sound opportunities to get rich slowly that often are overlooked by the average person.

For instance, did you know that if you started investing just a little more than \$80 every month at the age of 30, and got a 15% return compounded annually, by the time you were 65 it would add up to \$1,013,346? Over a million dollars from about \$80 a month!

Of course, this does not take into account the income tax you would pay on the return from your investment. But sound tax planning can reduce this factor to a minimum.

And if you are older than 30, it is true that you do not have as long a period of time to pyramid your savings, but you probably are earning more than you did at 30 and can afford to save and invest more than \$80 a month.

\$80 a month, admittedly, is not "small change." But with shrewd money management, many families can save that amount. And getting a return of 15% on an investment, although very good, is not as impossible as it may sound.

According to statistics, in one recent 20-year period, the combined annual return from dividends and capital appreciation on all common stocks averaged 14.3%. That's a figure that's all the more meaningful right now, when stocks are at a level where some experts think they may be bargains.

Similar returns may be found in well-chosen real estate investments or in a carefully managed family business.

Then why don't most of us end up with at least a million dollars by the time we're 65?

Sometimes it is due to unavoidable circumstances—unemployment, family illnesses, and so forth. But surely an important factor is simply a lack of knowledgeable planning and sound money management.

It is with this common problem in mind that the publishers of *U.S. News & World Report* have now developed the **MONEY MANAGEMENT LIBRARY.**

This series has been designed to provide you with the professional guidance necessary to manage your money: to help you do the best possible job of saving it—stretching it—investing it—minimizing the tax on it—and passing it on to your heirs.

To introduce you to this eye-opening series of books, we would like to send you the first book in the series to read and use free for 10 days. It's on a subject which affects virtually every financial transaction you engage in, and which can dramatically influence your financial well-being for better or worse: *the law.*

Called "What Everyone Needs to Know About Law," this book discusses—in concise, easy-to-understand language—the various kinds of law that effect your life. Tort law, which dictates the payment of damages for personal injury. The law of contracts, which governs everything from using the telephone to buying a home and operating a business. Estate law and banking law. Among the things you'll learn:

- An eight-point checklist to help protect yourself when a personal injury incident occurs.

- How to use a merchant's Retail Installment Contract to "shop around" for a better buy elsewhere.

- Five rules to help you protect yourself against deceptive sales practices.

- Oral agreements: when are they valid contracts and when are they not?

- How just a few sentences in your will can save your heirs hundreds or even thousands of dollars.

- If you sell real estate, you can save yourself thousands of dollars by having your broker sign an "exclusive agency" agreement rather than an "exclusive right to sell."

- How to spot costly problem areas in contracts before you sign them.

- The one important legal document you should not keep in your safe deposit box.

- Federal income tax audits: how to determine beforehand if your return is likely to be "flagged."

- How to go about administering an estate for which you have been named executor or executrix.

- A simple step that saves your life insurance proceeds from estate taxes.

- The value of saving your "closing statement" when you buy a home.

- Are you really protected if you hold onto your income tax returns for the customary three-year "statute of limitations" period?

- What are some of the legal actions you can manage without the services and expense of a lawyer?

Other books in the series will then explain in greater detail how to build and pass along your estate.

They include:

*"Planning Your Financial Future"*

*"How To Buy Real Estate"*

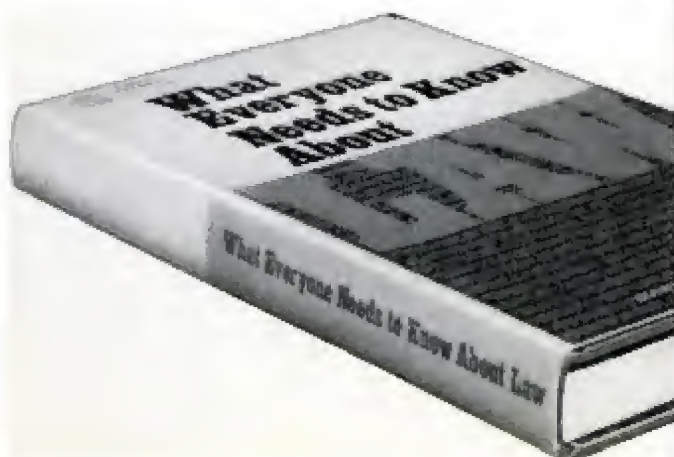
*"Your Income Tax: How To Save Money And Avoid Trouble"*

*"Stocks, Bonds & Mutual Funds"*

*"How To Find A Growth Stock"*

And in each book, everything you want and need to know is explained in the clear, practical, no-nonsense style for which the news magazine, *U.S. News & World Report*, is famous. The reliability of the facts is also in keeping with *U.S. News & World Report's* high standards.

To read the first book, "What Everyone Needs to Know About Law," free for 10 days, send no money—just mail the card or coupon. If you are pleased with it, you may keep it for only \$5.50 (a direct-to-you discount of more than 20% off the suggested retail price) plus shipping and handling, and continue to receive another book in the series on approval every other month. Or you may return your first book in 10 days and we will not send you any more. You may stop receiving books in the series any time just by sending us a postcard telling us to cancel.



## Books by U.S. News & World Report

Post Office Box 1004, Burlington, New Jersey 08016

Please send me "What Everyone Needs to Know About Law" for free examination. If I am not completely satisfied with it, I may return it within 10 days without paying or owing anything, and that will be the end of it. Otherwise I will keep the book for only \$5.50 (a saving of more than 20%) plus shipping and handling. You will then send me another volume in the series every other month, to examine free and to keep, if I wish, at the same low price. There is no minimum number of books that I must buy, and I may cancel my subscription at any time by notifying you.

Name

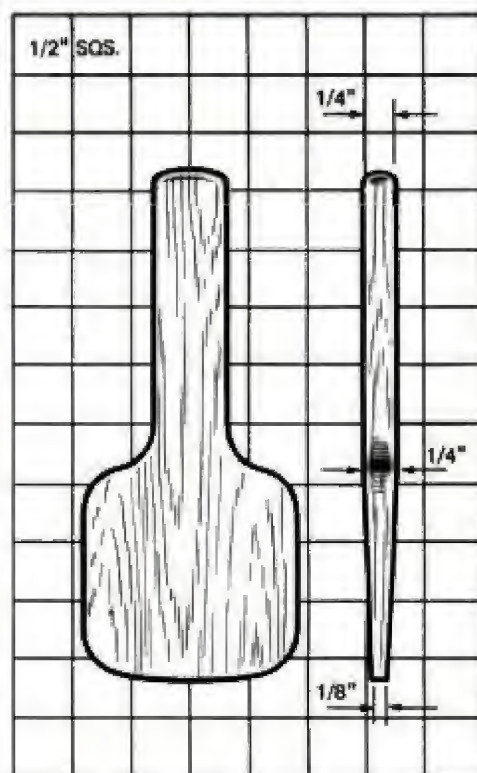
Address

City  State  Zip

MP-60



## Jam paddle



A good project for one of those puttering-around-the-shop nights is this jam paddle which can be turned out in quantity in very little time. The best part is that they can be made from scraps of hardwood left over from big projects. Start by making a master, reusable pattern of  $\frac{1}{8}$ -in. tempered hardboard. (Drill a hole through its handle and you can hang it on a nail between paddle-making sessions.) Cut hardwood blanks to size— $\frac{1}{4}$  x 2 x 4- $\frac{1}{2}$  in. and taper the lower 1- $\frac{3}{4}$  in. as shown, using either a belt sander or sander/grinder. Finally, trace the paddle and cut it out with coping or jigsaw. Finish by sanding the paddle smooth.—Al Sittner, Manhasset, N.Y.

Itching,  
chafing,  
rash,  
excessive perspiration,  
irritation,  
in the groin area,  
could be  
**Jock Itch**

Whether you're suffering from the bothersome symptoms, or Jock Itch (Tinea cruris), you should be using Cruex® Medicated Spray-On Powder.

Cruex provides fast relief. It soothes itchy, inflamed skin. Absorbs perspiration. Helps cushion against further irritation. And, because it's medicated, Cruex is strong enough to help prevent the fungous infection that can develop when these annoying symptoms are improperly treated.

Since Cruex is a spray-on powder: it penetrates into hard-to-reach places... you avoid the messiness of creams, ointments, and powders... and you eliminate the pain of rubbing, dabbing, or smearing on to sore, inflamed skin.

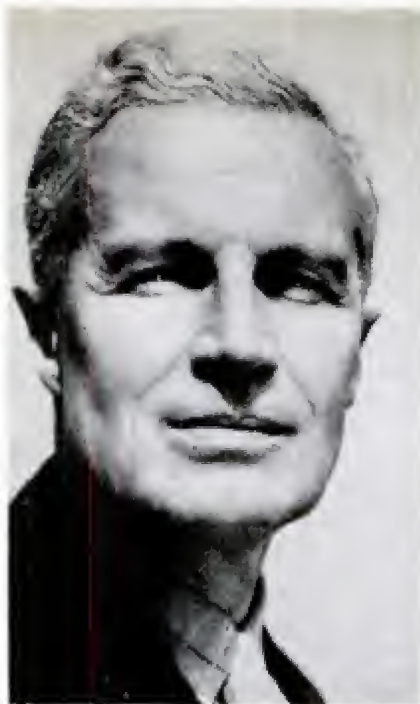
Get relief—fast. Avoid embarrassing itch, too.  
With Cruex. Soothing, cooling Cruex.

# Cruex

Guaranteed to work, or your money back from the manufacturer.







# I'd like to give this to my fellow men... while I am still able to help!

I was young once, as you may be—today I am older. Not too old to enjoy the fruits of my work, but older in the sense of being wiser. And once I was poor, desperately poor. Today almost any man can stretch his income to make ends meet. Today, there are few who hunger for bread and shelter. But in my youth I knew the pinch of poverty; the emptiness of hunger; the cold stare of the creditor who would not take excuses for money. Today, all that is past. And behind my city house, my

summer home, my Cadillacs, my winter-long vacations and my sense of independence—behind all the wealth of cash and deep inner satisfaction that I enjoy—there is one simple secret. It is this secret that I would like to impart to you. If you are satisfied with a humdrum life of service to another master, turn this page now—read no more. If you are interested in a fuller life, free from bosses, free from worries, free from fears, read further. This message may be meant for you.

By Victor B. Mason

I am printing my message in a magazine. It may come to the attention of thousands of eyes. But of all those thousands, only a few will have the vision to understand. Many may read; but of a thousand only you may have the intuition, the sensitivity, to understand that what I am writing may be intended for you—may be the tide that shapes your destiny, which, taken at the crest, carries you to levels of independence beyond the dreams of avarice.

Don't misunderstand me. There is no mysticism in this. I am not speaking of occult things, of innumerable laws of nature that will sweep you to success without effort on your part. That sort of talk is *rubbish*! And anyone who tries to tell you that you can *think* your way to riches without effort is a false friend. I am too much of a realist for that. And I hope you are.

I hope you are the kind of man—if you have read this far—who knows that anything worthwhile has to be *earned*! I hope you have learned that there is no reward without effort. If you have learned this, then you may be ready to take the next step in the development of your karma—you may be ready to learn and use the secret I have to impart.

## I Have All The Money I Need

In my own life I have gone beyond the need of money. I have it. I have gone beyond the need of gain. I have two businesses that pay me an income well above any amount I have need for. And, in addition, I have the satisfaction—the deep satisfaction—of knowing that I have put more than three hundred other men in businesses of their own. Since I have no need for money, the greatest satisfaction I get from life is sharing my secret of personal independence with others—seeing them achieve the same heights of happiness that have come into my own life.

Please don't misunderstand this statement. I am not a philanthropist. I believe that charity is something that no proud man will accept. I have never seen a man who was worth his salt who would accept something for nothing. I have never met a highly successful man whom the world respected who did not sacrifice something to

gain his position. And, unless you are willing to make at least half the effort, I'm not interested in giving you a "leg up" to the achievement of your goal. Frankly, I'm going to charge you something for the secret I give you. Not a lot—but enough to make me believe that you are a little above the fellows who merely "wish" for success and are not willing to sacrifice something to get it.

## A Fascinating and Peculiar Business

I have a business that is peculiar—one of my businesses. The unusual thing about it is that it is needed in every little community throughout this country. But it is a business that will never be invaded by the "big fellows." It has to be handled on a local basis. No giant octopus can ever gobble up the whole thing. No big combine is ever going to destroy it. It is essentially a "one man" business that can be operated without outside help. It is a business that is good summer and winter. It is a business that is growing each year. And, it is a business that can be started on an investment so small that it is within the reach of anyone who has a television set. But it has nothing to do with television.

This business has another peculiarity. It can be started at home in spare time. No risk to present job. No risk to present income. And no need to let anyone else know you are "on your own." It can be run as a spare time business for extra money. Or, as it grows to the point where it is paying more than your present salary, it can be expanded into a full time business—overnight. It can give you a sense of personal independence that will free you forever from the fear of lay-off, loss of job, depressions, or economic reverses.

## Are You Mechanically Inclined?

While the operation of this business is partly automatic, it won't run itself. If you are to use it as a stepping stone to independence, you must be able to work with your hands, use such tools as hammer and screw driver, and enjoy getting into a pair of blue jeans and rolling up your sleeves. But two hours a day of manual work will keep your "factory" running 24 hours turning out a product that has a steady and

ready sale in every community. A half dollar spent for raw materials can bring you six dollars in cash—six times a day.

In this message I'm not going to try to tell you the entire story. There is not enough space on this page. And, I am not going to ask you to spend a penny now to learn the secret. I'll send you all the information, free. If you are interested in becoming independent, in becoming your own boss, in knowing the sweet fruits of success as I know them, send me your name. That's all. Just your name. I won't ask you for a penny. I'll send you all the information about one of the most fascinating businesses you can imagine. With these facts, you will make your own investigation. You will check up on conditions in your neighborhood. You will weigh and analyze the whole proposition. Then, and then only, if you decide to take the next step, I'll allow you to invest \$15.00. And even then, if you decide that your fifteen dollars has been badly invested I'll return it to you. Don't hesitate to send your name. I have no salesmen. I will merely write you a long letter and send you complete facts about the business I have found to be so successful. After that, you make the decisions.

## Does Happiness Hang on Your Decision?

Don't put this off. It may be a coincidence that you are reading these words right now. Or, it may be a matter that is more deeply connected with your destiny than either of us can say. There is only one thing certain: If you have read this far you are interested in the kind of independence I enjoy. And if that is true, then you must take the next step. No coupon on this advertisement. If you don't think enough of your future happiness and prosperity to write your name on a postcard and mail it to me, forget the whole thing. But if you think there is a destiny that shapes men's lives, send your name now. What I send you may convince you of the truth of this proverb. And what I send you will not cost a penny, now or at any other time.

**VICTOR B. MASON**  
1512 Jarvis Ave., Suite M-2-EJ  
CHICAGO, ILLINOIS 60626



## TRACK TRACTION



Mini-Dozer has great power, maneuverability. Complete kit saves \$1! Gardening, hauling, dozing, mowing. 7 to 16 hp. 30 attachments. Dozer kit catalog, 50¢; "Build-it-yourself" Plans, \$6 (refunded on any purchase). **Struck Corp.**, Dept. PM85, Cedarburg, Wis. 53012

## Be a MOTORCYCLE MECHANIC...

If You Like to Ride a Bike for Fun ... Learn to Fix it for Profit! Make good money whether you work for someone else or have your own shop. Learn at home how to fix any part of any bike! Send name, address, age for FREE "Career Kit". **NORTH AMERICAN SCHOOL OF MOTORCYCLE REPAIR**, Dept. #4978, 4500 Campus Dr., Newport Beach, CA 92661

## BASEMENT TOILET

Flushes up to existing sewer or septic tank by powerful, self-contained pump operated by normal water pressure. No digging up floors. Clog resistant, easily installed. Make basement into game room, den, apartment with private bath. Financing available. Write for free literature. **Dealer inquiries invited.** **SANDERS**, Dept. J-25, Box 92102, Houston, TX 77206.

**HEADQUARTERS FOR EVERY TYPE & SIZE AT REAL DOWN-TO-EARTH MONEY SAVING PRICES!**

**TIRES!** ALL FANCY BRANDS! AUTO TRUCK SPORT CAR FARM TRAILER

**TREMENDOUS SAVINGS!** LET US PROVE IT TO YOU ... WRITE US TODAY ...

Send for your FREE catalog!

**RELIABLE TIRE CO.** 1111 Chestnut St. Camden, N.J. 08103

## FIX LAWN MOWERS FOR FUN & PROFIT



Facinating new Handbook by P. Peterson gives you the knowledge skilled mechanics learn. OVER 120 ILLUSTRATIONS show how to trouble shoot, repair, reconstruct, adjust, balance and sharpen blades, etc. Etc. Detailed drawings are extensively used. INSTRUCTIONS COVER fuel, mowing and other mowers, preventive and routine maintenance, how to identify brand names, where to obtain replacement parts, how to buy and use a lawn mower. Friends gladly pay \$50 to \$90 to fix their lawnmowers. Try the HANDBOOK OF LAWN MOWER REPAIR. Rush only \$7.95 plus 50¢ handling on 10-day money-back guarantee.

**EMERSON BOOKS, INC.** Dept. 395B  
Buchanan, New York 10811

## IMPORTED LOCK BLADE KNIFE

ONLY \$275 each  
9" Overall Length  
5" When Closed

- Opens instantly
- Sharp and Tough
- Stainless Steel Blade

Flips open instantly and locks automatically to prevent accidental closing. Razor sharp tough stainless steel blade for reliable use and hard, long service. Money back in 5 days if not satisfied. Send \$2.75 plus 25¢ to cover postage and handling.

**WESTBURY SALES CO.**

P.O. BOX 434, WESTBURY, N.Y. 11590  
DEPT. L-8-PM

## BUILD YOUR OWN GRANDFATHER CLOCK



Save over 50% by building your own grandfather clock. Stately, straight-sided "AMERICAN CLASSIC" with beveled plate glass sides. Narrow waist design: "SPIRIT OF '76" with finely sculptured crown and brass-tipped pillars; or easy to build, always popular "SPIRIT OF THE CENTURY." Our kits are Red-I-Kit, semi-assembled, hand-crafted of solid 3/4" kiln-dried mahogany, cherry or walnut. Tubular bell or Westminster rod chimes. Moving moon dials painted by our own artists, and our own original Goddess Diana or Lady Florentine pendulums. Gorgeous solid bronze dials with raised numerals and carvers. Send \$2.50 for all three plans, plus description of kits and movements, as folks have for more than fifty years.

**KUEMPEL CHINE CLOCK WORKS & STUDIO**  
1115 Milwaukee Blvd., PM-14 Escalier, Mo. 65321

## PUMP DRAINS pools, cellars, laundry tubs IRRIGATES — CIRCULATES — SPRAYS

Heavy duty ball bearing pump. All metal, rust-proof Type X8. Stainless shaft. Use 1/4" HP or larger. 1 HP 1,200 GPH 60" high or 3,000 GPH 25' well. 5,200 GPH max. 114" in. 1" out. Belt or direct drive. \$17.95 Type P won't rust or clog. Bronze bearing. To 2,400 GPH. 1" in; 3/4" out. \$11.95 Piped cash with order. Money back Guarantee.

**LABAWCO**, Box 40, Belle Mead, N.J. 08502

## BETALLER

Stand 26 inches TALLER in a few weeks! GUARANTEED! All ages. No gimmicks. Send 35¢ for information to Tall Up, Box 18037 ZG St. Bern. Sta., Cincinnati, Ohio 45217

## Print Your Own

Cards, Stationery, Advertising, Labels, Tickets, announcements, QSL cards, greeting, sympathy, prayer cards, etc. Save money. Print for others and profit. Have home print shop. Pays for itself in a short time. Sold direct from factory. Easy rules sent. We supply everything. Send 25¢ for catalog. **KELSEY PRESS**, 75-BU Meriden, Conn. 06450

## Hard-to-Find QUALITY KITS

Send 25¢ for this catalog of Great Early American clocks, guns, ships, many other items in kit form — Complete in every detail — ready to build and enjoy.

**kits'n'crafts**  
204-PMB, Appleton St.  
Holyoke, Mass. 01040

## Repair any watch

... LEARN AT HOME Unique Sweeney System develops your watch repair skills step by step at home in spare time. No previous experience needed. Low tuition. Free sample lesson and full information. **CHICAGO SCHOOL OF WATCHMAKING** Dept. 185, Fox River Grove, Ill. 60021

## DO IT YOURSELF! MAKE MONEY CUSTOMIZING VANS, CARS, CYCLES!

Save \$555 doing your own work — make \$555 customizing for others, spare time or full. You don't need special talent — just tools and professional guidance. And, that's what you get. Tools you need, plus easy, step-by-step instructions. **LEARN CUSTOMIZING INSIDE AND OUT!** Discover how to create wild custom effects with air brush and decal, install outside "add-ons" like porches, scoops, etc. Do interior upholstery, carpeting, make built-ins, etc. Get This FREE Book! Tells you all about car customizing profits at home in spare time. Write today!

**CUSTOMIZING CENTER**, "Careers Through Home Study", 4401 Birch Street, Dept. 88075, Newport Beach, CA 92660

Rush FREE information on customizing. No obligation, no sales man will call.

Name \_\_\_\_\_ Age \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## learn ACCOUNTING at home

100% high pay "big income" jobs open to men, women in Accounting, Bookkeeping. 1st Return. Send for FREE "ACCOUNTING CAREER KIT." Approved for Veterans.

NAME \_\_\_\_\_ AGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
FREE BOOK CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_  
BOOK NORTH AMERICAN SCHOOL OF ACCOUNTING, 80075  
Enrolled Master, National Inst. Study Support, 4500 Campus Dr., Newport Beach, CA 92660

## UPHOLSTERY/DECORATING made easy!

**EARN AS YOU LEARN AT HOME** Send for free book about fascinating profession for men, women, all ages. Simple home study includes materials, frames, tools to make new furniture, redo old, keep or sell for profit. Easy to learn for handy folks. Professional accredited Diploma. Approved Vet. Training. No salesman. Upholstery & Decorating School, Div. Technical Home Study School, Dept. 110-085, Little Falls, N.J. 07424.

## WEIGHT LIFTING EQUIPMENT

Complete catalog of over 90 items used by strong men, body builders and athletes to develop strength and muscles.

Send 35¢ today for your copy

## WEIGHT LIFTING EQUIPMENT

P.O. Box 662 Holyoke, Ma. 01040

## FIND BURIED TREASURE!

DETECTS COINS, RINGS, GOLD, SILVER Dealers Wanted

Send for FREE Catalog  
**White's Electronics, Inc.**  
Dept. PASH  
101 Pleasant Valley Rd. Phone  
Sweet Home, Oregon 97386 (503) 367-2138

## New Polisher-Sander That...

Leaves NO SWIRL MARKS. Safe for Painted Metal & Fiberglass. U.L. Apvd. NOT a rotary. Made in U.S.A. Send For Details & Prices.

## LEON BLACKLEDGE Sales Co.

250 Summit St., Souderton, Pa. 18944

## YOU-A LEGAL INVESTIGATOR

**WITHOUT COLLEGE TRAINING!** Many busy trial lawyers turn over vital pre-trial investigations to their LEGAL INVESTIGATORS. Such men, women gather evidence for court use. Non-college men, women may qualify thru home training. Details FREE by mail. **UNIVERSAL SCHOOLS (homestudy)** Dept. 11110-085, Little Falls, N.J. 07424.

## NEW DESIGN—FITS ALL PEGBOARDS!

World's best storage system. Every home, factory, and business needs this professional mounted cup and unbreakable jar. Keeps small shop supplies, tools and more. Holds Family Caps and Jars. 14 for \$4.95, 24 for \$12.50, 32 for \$22.50. Postage Paid, no C.O.D.'s. Send check or M.O. Dealer inquiries invited. **WICKLIFFE INDUSTRIES, INC.**  
P.O. Box 286 PM 85  
Wickliffe, Ohio 44092

## LEARN MEAT CUTTING

Train quickly in 8 short weeks at Toledo for a bright future with security in the vital food business. Big pay, full-time job—HAVE A PROFITABLE MARKET OF YOUR OWN! Time payment plan available. Diploma given. Job help. Thousands of successful graduates. OUR 6th YEAR! Send NOW for his new illustrated FREE catalog. No obligation. U.S. approved. **NATIONAL SCHOOL OF MEAT CUTTING** No. 03972 Dept. 30-N, Toledo, Ohio 43604

## The Real McCoy SHOP APRONS

OFFICIAL POPULAR MECHANICS aprons in three models including the hard-to-get roofers (mini) and shorty shop, both with triple, full-depth, nail pockets and the full length standard shop size. Burlington 10 oz industrial denim. "Red-stripe" woven tapes. Great collectors item! \$2.95 each plus 25¢ shipping (specify style) or SPECIAL SET OF ALL THREE: \$8.95 postpaid. **POPULAR MECHANICS**, BOX 1014, Radio City, New York, N.Y. 10019



## NEW CAR AT OLD PRICES

(Continued from page 61)

place it with duals. But what do you do with the plumbing you pulled out of the car?

The second list consists of accessories you can install yourself (see the drawing on pages 60 and 61). This is basically a screwdriver and pliers list. The necessary wiring or components you will hook up with are already on the car. There's no major mechanical surgery involved.

One item, a remote-control, side-view mirror, has been omitted from both lists. The reason is that it falls in the either-or category. You can have it installed at the factory or install it yourself. You come out about the same either way. There's no choice.

One of the mechanics who worked with PM in compiling the lists is a professional. Bob Swailes is service

### FACTORY INSTALLED ACCESSORY LIST

If you want the following accessories on your car, you should have them installed at the factory.

- Automatic transmission
- Dual exhausts
- Engine of proper size (6 or 8 cylinders)
- Fluid-level indicator for windshield washer
- Heavy-duty charging system
- Heavy-duty cooling system
- Hydraulic steering stabilizer
- Interval windshield wipers
- Power disc brakes
- Power door locks
- Power drum brakes
- Power seats
- Power steering
- Power windows
- Radial tuned suspension
- Radio antenna mounted in windshield
- Skid control
- Speed-control device
- Tilt steering wheel
- Tinted windshield
- Trip odometer

manager for a large Shell station. He is a car buff and has participated in racing events.

After working over the lists with Swailes, PM submitted them to a non-expert. Doug Collins works for a fire department in a small town in Michigan. Doug is a typical do-it-yourselfer. He works on his own car and has a home-handyman set of tools. He does not have the specialized tools available to Bob Swailes. Collins said he would be game to tackle any job listed in the do-it-yourself column.

If you aren't in the market for a new car but are considering fixing up the old car, one item on the factory-installed list can be transferred to the do-it-yourself column. There's now a kit on the market for attaching the radio antenna to the windshield. It's on the windshield, rather than in the glass as in a factory-installed unit, but it's just as effective as the in-the-glass version. ★ ★ ★



## Scamp

BUILD YOUR OWN TRAVEL TRAILER

- Hunting
- Fishing
- Camping
- Sleeps 4
- Guaranteed

For the first time - a Do-It-Yourself Kit! No welding. Scamp kit includes all parts you need and fully-illustrated step-by-step assembly manual. Scamp can be completed in 40 hours with minimum tools. Also available ready to hitch-up-and-go.

Write: SCAMP, DEPT. PM8, Backus, Mn. 56435  
 Rush me Brochure/Info. \$1.00 Enclosed  
 Name \_\_\_\_\_ Age \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_  
 Phone: Bus. \_\_\_\_\_ Home \_\_\_\_\_

## NEW RUBBER STAMP BUSINESS PAYS BEGINNERS UP TO \$16.50 AN HR. Start at Home in Spare Time

The multi-million dollar Rubber Stamp business—once controlled by a few big companies—is now being taken over by small operators—one in each community throughout the United States. Men and Women who have this inexpensive machine can turn out huge quantities of Rubber Stamps with special wording that buyers once were forced to buy from big cities. Material costing only 27¢ makes a stamp that sells for \$2.75. The machine that does the work is simple and easy to operate and it turns out as many as six Rubber Stamps at a time, each with different wording such as names, addresses, notices, stock numbers, prices and other "copy" needed by offices, factories and individuals. Working full capacity, it can earn as much as \$33.00 an hour for the operator! Now you can get into the big-pay business yourself, with your own home as headquarters. You don't need experience. We supply everything, including complete instructions and eight ways to get business coming in fast. We even help finance your start! Start making up to \$16.50 an hour from the very beginning. Cash in on the profitable Rubber Stamp business in your community, right away. We'll mail full particulars FREE and no salesman will call. Be first in your locality. Rush coupon today or send your name on postcard to:

**RUBBER STAMP DIV., Dept. R-2-EJ**  
 1512 Jarvis Avenue • Chicago, Ill. 60626

THIS LITTLE TABLE TOP MACHINE  
MAKES EVERYTHING SIMPLE & EASY



MAIL  
THIS

### RUBBER STAMP DIV.

1512 Jarvis Ave., Dept. R-2-EJ, Chicago, Ill. 60626

Please rush full particulars about your financing plan and the little machine that can get me started in the profitable Rubber Stamp business at home in spare time. Everything you send me is FREE and no salesman will call.

Name \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_ Zip \_\_\_\_\_

## HOW TO MAKE MONEY WITH GUNS!

Train at Home in Spare Time to be a GUN PRO.

LEARN GUN REPAIR, custom-stocking, ammo-making, ballistics, etc. Send for Career Kit — ALL FREE!

Be a GUN PRO

4500 Campus Dr. Dept. PM 02 • Newport Beach CA 92663

Name \_\_\_\_\_ Age \_\_\_\_\_  
 Address \_\_\_\_\_  
 City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

## FIND BURIED TREASURE

Powerful electronic detector finds buried gold, silver coins, etc. Write or call for free catalog. Dealer inquiries invited.

Financing Available  
 Phone day: night (713) 682-2728  
**RELCO, Dept. D.D.62**  
 BOX 10839, HOUSTON, TEX. 77018

## CUSTOMIZE AUTO/VAN INTERIORS

Take In Up To \$750.00 Per Week!

UPHOLSTER ANY VEHICLE—START WITH YOUR OWN CAR OR VAN!

A business so big, growing so fast, you need an appointment in most auto trim shops! Send for **FREE MASTER PLAN, ILLUSTRATED BOOKLET** on learning auto upholstery and interior customizing in your spare hours. No experience needed. VET APPROVED.

**AUTO UPHOLSTERY INSTITUTE,**  
 1205 W. Berkeley, Dept. 4PM, Chicago, CA 92664

**FREE BOOKLET!**

## INVISIBLE VINYL REPAIR

## QUICK! BIG PAY!

Make a good \$30 for each hour's work in your own business, part time or full time. . . 24 hours after you get big low-cost VIP Vinyl Repair kit. Invisibly repair and restore vinyl, leather, naugahyde. Quick, easy. Big demand. Homes, businesses, car shops, restaurants, unlimited customers. No waiting, no school, no franchise, you keep all profits. Big fast steady earnings. Details mailed FREE.

VIP, Dept. 187, 2021 Montrose, Chicago 60618.

# Avis

## INDUSTRIAL CORPORATION

Here's POWER when and where you need it most. Dependability and confidence will be your mood with an Avis trouble free Powr-Pak engine generator unit. Whether it be for your home, your home on wheels, your camp, or your shop, we want to tell you about Powr-Pak. For further information please write or call.

**DEALER OPENINGS STILL AVAILABLE**



## Powr-Pak

### Engine Generator Units

**AVIS INDUSTRIAL CORPORATION**  
 Dept. PM, Decatur, Indiana 46733  
 Telephone (219) 565-3191



# Richard Petty asks: “Why pay repair bills, when you can learn to fix your own car... at home, in your spare time?”

## Learn Automotive Servicing the NRI way!

“Knowing how to take care of your own automobile can mean real money in your pocket. You save every time the car needs a tuneup, and a little preventive maintenance keeps it running a lot longer between major repairs. And with the cost of gas what it is, being your own tuneup man can mean smaller gas bills each month.

The best way I know to learn auto repair at home is NRI's home training. It's the most up-to-date complete course in Auto Mechanics I've ever seen.

### Hands-on training... with diagnostic equipment

NRI offers two courses: a Basic Tuneup and Repair Course, and a complete Master Automotive Technician's Course. Both offer you essential training and diagnostic equipment for under-the-hood experience.

The 30 lesson Basic Tuneup and Repair Course tells you all you need to know to perform

Richard Petty,  
America's Winningest  
Stock Car Driver  
and NRI  
Automotive  
Consultant



most upkeep jobs. In addition to NRI's unique personal services and “bite-size” texts, you get eight important service items, including a Dwell Tachometer, AC Power Timing Light, Volt Amp Tester, and Tune-Up Tool Kit.

### How to become a professional mechanic

NRI's Master Automotive Technician's Course is designed for the man who wants to go all the way... to be able to service and repair every component and every system in the automobile. In addition to the 70 lessons, you receive ten pieces of auto service equipment, including a Dwell Tachometer, AC Power Timing Light, Volt-Amp tester, solid-state Ignition Analyzer Scope, and a complete set of tools. You pay nothing extra for the tools and equipment, and they're yours to keep.” SEND FOR FREE CATALOG TODAY!



You get all this equipment and more with the NRI Master Automotive Technician's Course... including NRI's exclusive Achievement Kit, and 70 profusely illustrated “bite-size” lesson texts.



**NRI SCHOOLS**  
McGraw-Hill Continuing Education Center  
3939 Wisconsin Avenue, Washington, D.C. 20016  
Check below for your free Automotive catalog. Or select one of the other courses instead. NO SALESMAN WILL CALL.

946-005

☐ **AUTOMOTIVE  
MECHANICS  
COURSES**

☐ TV/Audio, Communications,  
and Computer  
Electronics Courses

☐ Air Conditioning,  
Refrigeration, and  
Heating Courses

Name \_\_\_\_\_ Age \_\_\_\_\_  
(Please Print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

☐ Approved for career study under  
GI Bill. Check for details.

Accredited Member National Home Study Council

## NEXT MONTH IN PM...

- 10 hideaways you make to protect your valuables
- How cars shape up for the '80s
- Previews of the '76 outboards and the new TVs
- Lush greenhouse in your window—a weekend project
- Be happy painting your house
- Table-saw tricks with a portable saw

**SUBSCRIPTION SERVICE:** Mail all subscription orders, changes of address (with your latest label), and Postmaster notices of undeliverable copies to Popular Mechanics, P.O. Box 646, New York, N.Y. 10019. All other correspondence relating to your subscription: James Gable, Customer Service Department, Popular Mechanics, P.O. Box 1567, New York, N.Y. 10019. Please enclose your latest mailing label for quickest service when writing about your subscription.

## Popular Mechanics

250 West 55th St., New York, N.Y. 10019  
WPM5H1

**YES!** Please enter  
my subscription  
to POPULAR MECHANICS for:

- ☐ 1 year \$7.00 ☐ New  
☐ 2 years \$13.00 ☐ Renewal

Payment of \$\_\_\_\_\_ is enclosed.

Bill Me \_\_\_\_\_  
Initial here

Name \_\_\_\_\_ (please print)

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

On new subscriptions, first copy will arrive in about 8 weeks.

(Above prices apply in U.S. & Possessions only. Canada add \$3 per year. All other countries add \$5 per year.)

## CHANGING ADDRESS?

If you're planning to move, please let us know at least six weeks before changing your address. Attach current address label and fill in your name and your new address. This will serve to insure prompt service on your subscription.

Send old label with your name  
and new address to:  
POPULAR MECHANICS, Subscription Dept.  
Box No. 646, New York, N.Y. 10019

NAME \_\_\_\_\_ (Please print)

NEW ADDRESS \_\_\_\_\_

CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP CODE \_\_\_\_\_



## WIN THIS ELECTRIC CHASSIS

(Continued from page 47)

sign alone, produced according to the rules specified, is all that will be judged.

Judging will be based on the following factors:

**How it looks.** The two-passenger fiberglass body designed for the Elcar Model No. 2000 by Zagato is simple and practical, and attracts a lot of smiles and horn-blowing reactions. Yours can be as different and innovative as you wish, but should produce similar reactions. If you can figure a way to put a sports car, utility wagon or streamlined sedan body on a 63-inch frame, more power to you. It needn't be "beautiful" but should be distinctive.

**Easy to build.** The materials you specify must be readily available and easily worked to achieve your design, without complicated or expensive processes. They should not, for instance, call for special castings or stampings. The use of several different materials to achieve particular purposes is allowable. But it should be possible to build the entire body with hand or power tools commonly used in home workshops rather than industrial shops. Such factors will be considered in the judging.

**Utility.** Vehicle dynamics should be carefully considered. The Elcar No. 2000 chassis was designed to carry a payload of 640 pounds, including 300 pounds for the Zagato fiberglass body and 340 pounds for two passengers and a suitcase or some groceries. (Curb weight of the chassis is 1290 pounds, turning diameter 21 feet.) You are free to divide the total 640-pound payload allowance in any way you wish between body weight and useful payload. Judges will consider the most efficient use of total chassis payload, as well as space utilization for seating and storage, ease of passenger entrance and exit, and overall passenger comfort factors.

**Cost.** While there are no contest limits on the cost of materials to build the body you design, judges will take into account how that cost affects the total value of the vehicle compared with Elcar's \$3395 for its complete two-passenger car. If you are able to design a more interesting or attractive body that brings the total value of your car to less than the retail cost of a complete Elcar No. 2000, it will gain more points with the judges than if it should run much higher.

**Safety.** To conform with safety regulations, your car should meet street legality requirements and have

the following equipment if you hope to license it for use on local roads: headlights, taillights, brake lights, turn-indicator lights, windshield wipers, safety glass for the windshield, seat belts and substantial bumpers anchored to the frame.

The judging will be performed by a panel of experts: Jay Doblin, Chicago industrial designer and former executive designer for Raymond Loewy as well as director (14 years) of the Institute of Design at the Illinois Institute of Technology; Harry Bradley, automotive designer associated with the Art Center College of Design in Los Angeles, and former senior automotive designer for General Motors; Robert Culver, technical director of Elcar Corp.; Bill Hartford, automotive editor of *PM*; Robert Lund, Detroit automotive editor of *PM*; Michael Lamm, West Coast editor of *PM*. (Should any judge be unable to serve, a qualified alternate will be selected by *PM*.)

The decision of the judges will be final, conclusive and binding on the contestants. The winner of the PM Electric Car Body Design Contest will be announced in the December issue of *Popular Mechanics*. The prize-winning design will be published in the same issue. Plans and instructions for building the winner will be published in a subsequent issue to be announced. ★ ★ ★

## ROAD-TESTING THE ELECTRIC CAR

(Continued from page 47)

little car hummed along quietly and happily.

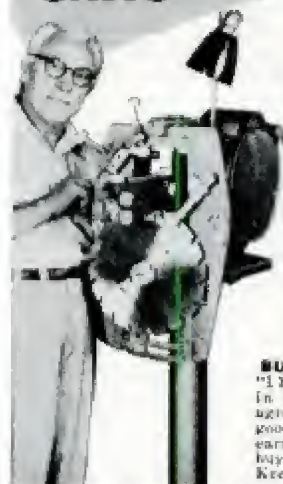
Actually, it's hard to know what speed you are making in an Elcar, since the speedometer is calibrated in kilometers—which gives the illusion that you are going much faster than you really are. But with a top speed of 35 or so it's academic—almost.

I found 35 mph was more than fast enough to keep up with the morning traffic in downtown Elkhart when I drove around down there with Dan Gegax, Elcar's manager of consumer sales, who served as my check pilot from the passenger's seat. We rumbled over wavy, chuck-holed brick paving with no more pitching than you might expect with an ultrashort wheelbase (51 inches). It took me a while to learn to drop the range dial to second speed when going into the corners, and into first when approaching stop signs.

The 2000 also has a booster switch on the dash that you can throw after achieving top speed. It weakens the magnetic field in the coils and allows the armature of the motor to develop more torque. This drops the car into a sort of "overdrive" and you can feel the surge as it gains another few mph. Using this device on a long straight

(Please turn to page 122)

## Be Your Own Boss In a Business of Your Own SHARPENING SAWS



**SHARPENS 1000 SAWS A YEAR**—"I sharpen around 1000 saws a year in my part-time shop. Work comes from as far as 25 miles away!"—Joe H. Walker.

**FOLEY FILER BUYS OUR GROCERIES**—"I have filed about 500 saws in spare time. My wife agrees the Foley Filer is a good investment because it earns enough extra cash to buy our groceries!"—R. J. Kueker.

## Earn \$5 to \$8 An Hour

Here is a steady repeat CASH business that pays from \$5 to \$8 an hour, and you can start in your own basement or garage in your spare time. Every saw you sharpen with the machine accuracy of the Foley Saw Filer is an ad that brings more customers. J. C. Delbert wrote us: "Since I got my Foley Filer five years ago, I have averaged 4 1/4 saws each day over all this time." Howard Kuhns says: "We operate 2 Foley Filers and our business averages about 500 saws per month. The count last year was 5,798 saws."

The new model Foley Saw Filer is the first and only machine that automatically sharpens combination (rip and crosscut) circular saws—also all hand saws, band saws and crosscut circular saws. The adjustments are simple—there is no eyestrain—and you can start right away to turn out perfect cutting saws. Exclusive jointing action evens up irregular teeth—old saws cut like new!

## WE FINANCE YOU

Foley will help you get started with minimum investment. No franchise fee. Write for complete information. No obligation.

## Send for FREE INFORMATION

**FOLEY MFG. CO.** 816-5 Foley Bldg., Minneapolis, Minn. 55418

Send me free information and how Foley will finance me.

Name .....

Address .....

City ..... State ..... Zip .....

## EARN MONEY FAST!

### REPAIR HYDRAULIC JACKS

Ever while you learn at home. Millions of jacks in gas and auto service stations, trucking firms, body shops, riggers, factories and farms need servicing. Most of which you can learn to repair. We show you HOW. Start your own in your basement or garage. Big opportunity for mechanics. ACT NOW!



Write for folder No. PM-1 and free course offer.

**HYDRAULIC JACK REPAIR MANUAL CO., INC.**

P. O. BOX 3 • STATEN ISLAND, N. Y. 10314

## I turn WEAKLINGS into CHAMPIONS!

My method of DYNAMIC-TENSION starts giving results in just 7 days—adds pounds of big muscles—lose "pot belly." Send name & address for my 32 page book

—FREE. **CHARLES ATLAS**

49 W. 23rd St., N.Y. 10010, Dept. HB



**LEARN SURVEYING AT HOME**

U.S. Bureau of Labor Statistics predicts shortage of 50,000 civil engineering technicians (surveyors, etc.) by 1975. Send for FREE "SURVEYING CAREER KIT."

NAME ..... AGE .....

ADDRESS .....

CITY ..... STATE ..... ZIP .....

**NORTH AMERICAN SCHOOL OF SURVEYING & MAPPING**  
4500 Campus Drive • Dept. 2 • 90725 University Plaza, Newport, Calif. 92660



# To help stop Athlete's Foot more families buy Desenex® than any other remedy.

That's because anti-fungal Desenex contains a medically-proven formula that has successfully helped millions of sufferers. And the number gets bigger every year.

To help heal Athlete's Foot, use Desenex Ointment at night and Desenex Powder, or Aerosol, during the day.

When used routinely, Desenex provides continuing protection against fungous infection.



Also available in solution form.

©1974 Pharmacia Consumer Products

A PRODUCT OF PENNALT CORPORATION

## breakerless ignition

The only CD/Breakerless Ignition that fits virtually all U.S. and foreign cars, off-road and RV's, 4, 6 and 8 cylinder.

Replace your outdated points and condenser with solid state ignition circuitry that never needs adjustment or replacement! Mobelec dramatically increases your car's performance while extending spark plug life. Keep your car in "top tune" year after year. Each Mobelec Breakerless Ignition is guaranteed for 2 full years!

### Easy to install!

- Remove distributor cap. Do not remove distributor.
- Replace your out-dated points and condenser with your new Mobelec sensing unit. Set gap.
- Replace distributor cap. Set timing, and you're ready to run!

ONLY \$9850

Order now! Use your BankAmericard Mastercharge (specify # & expiration date), cash, check or money order.

MARDEK CORPORATION, P.O. Box 2680 858 Production Place RT Newport Beach, California 92663

## FREE BLUEPRINTS and PLAN READING LESSON



**CHICAGO TECHNICAL COLLEGE**  
2000 So. Michigan Ave., Chicago, Ill. 60616

Beginners, craftsmen, even foremen and super-intendents, have sent for these free blueprints and trial lesson in Plan Reading as a means of trying out Chicago Tech's home-study Builders training. Learn how you can master Plan Reading—Estimating—and the practical details of all types of construction in your spare time at home. Mail coupon below today—see how you, too can prepare for a better job—higher income, or start your own contracting business.

CHICAGO TECHNICAL COLLEGE  
Dept. PM-85, 2000 S. Michigan Ave.,  
Chicago, Ill. 60616

Please mail me a Free Trial Lesson, Blueprints and Builders Catalog. I understand there is no obligation—no salesman will call.

NAME \_\_\_\_\_ AGE \_\_\_\_\_  
ADDRESS \_\_\_\_\_  
CITY \_\_\_\_\_ STATE \_\_\_\_\_ ZIP \_\_\_\_\_

Veterans  
Check  
Here ☐

## ROAD-TESTING THE ELECTRIC CAR

(Continued from page 121)

stretch, I actually got the electric up to 60 kilometers, or 40 mph. Once on to this wrinkle, I really had fun with the thing, racing it over lumpy pavement and up and down slopes. With a running start, most of Elkhart's modest hills offered no problem, though starting on them from a standstill was pretty pokey.

While the car brakes to a stop within 65 feet from top speeds, which seemed fair enough, the sensation was something else. There's no engine compression to help; it feels like braking while coasting downhill in neutral in a normal car. And when you come to a stop at a light there's a tendency to reach for the starter key. It's like you've stalled. There's no idling; just dead quiet.

Leon Shahnasarian, president of Elcar, does not plan to settle for just novelty and a two-man pop-about. He's convinced that practical electric transportation for the family is possible. His four-passenger version of the Elcar is a first step in this direction. What he has done is to have fiberglass experts build an extension on the rear of the present design, with a hatchback and room for two more seats (with pretty good legroom). I drove the vehicle around the parking areas just for fun—not testing. The car is still a prototype; production is planned for 1976.

### "It simply bounced away..."

How safe are the little shopper-hoppers? While no one, including Shahnasarian, recommends taking them out on high-speed freeways, they do conform to the safety specs of most states. And the cars have a few safety characteristics of their own. "One of our cars was in an accident recently," Shahnasarian reveals. "It was rammed from the rear by a big Detroit car, which sustained \$300 damages. There was no damage at all to the Elcar—it simply bounced away from the impact. This was due to a combination of its weight, its tough, rubber-trimmed bumper anchored to the rugged chassis, and the 'give' of the fiberglass body."

As far as Shahnasarian is concerned, the electric car is a vehicle whose time has come.

Should you buy one? Well, they are a lot of fun. But for their limited use the price isn't exactly low. The 1000 starts at \$2995; the 2000 bottoms at \$3395. You can be sure that the four-passenger model, when it's ready, will top that.

Shahnasarian insists that if you use it regularly for short hops, either of the two-passenger models will pay for itself in three years—in gasoline and maintenance savings. The basic car should last a lifetime, he points out, if properly cared for. Batteries, if properly maintained, should be good for 14,000 or 15,000 miles. That, in a car used only for short local hops, should see you through two or three years. Then a new battery pack will run you approximately \$400.

That adds up to about \$130 maintenance per year, which isn't bad. ★★



# CARRY-ALL



**Whatever the reasons,  
a bag for all seasons.  
\$3.95**  
Postpaid

The whole family will make use of this great utility shoulder bag. Fashioned from 100% Burlington cotton denim, it's heavy duty and washable. (It shrinks, bleaches and develops a comfortable feel.)

Looks so good that friends and neighbors will want to know how to get theirs. Perfect for back-to-school, tool toting, bike riding, shopping, news routes, the beach, picnics, the laundry and any activity where you can use two free hands.

Comes in natural or traditional blue denim.

Clip and mail to:

**Popular Mechanics Carry-All,  
Box 1014, Radio City Station, N.Y., N.Y. 10019**

(Imprint color)

Red White Yellow Black

Natural

Blue

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Write quantity desired in proper boxes.

Please send me \_\_\_\_\_ CARRY-ALL bag(s) as indicated above. I enclose my check or money order for \$3.95 each, postpaid.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_

State \_\_\_\_\_

Zip \_\_\_\_\_

HM Specialties



# The Bargain Hunter

make your  
own  
solid-state

## CLOCK

It's easy with the General Time battery clock movement kit we'll send you.

Make your own cordless clock from a picture, model, needlepoint, planter or make a built-in clock behind paneling, wallboard or plastic. Just use your imagination and the complete General Time clockmaker kit we'll send. Includes precision solid state General Time jeweled movement, complete with decorative hands, and easy-to-follow instructions. No special tools needed. Make clocks for your own use, for unique gifts, for fund raising, or to sell at a big profit. This is the same fine quality movement made for Westclox and Seth Thomas timepieces. Send only \$12.50 ea., 4 for \$39.95 plus \$1 shipping cost. It's FUN! Get started now—ORDER TODAY.

**GENERAL TIME SERVICE**  
A TALLEY INDUSTRIES COMPANY

(Send check or m.p. to Dept.  
PM-8 nearest service center.  
Include local tax, where  
applicable.)

General Time Service  
2047 E. Camelback Rd.  
Phoenix, AZ 85016

General Time Service  
540 Mission St.  
San Francisco, CA 94105

General Time Service  
150 E. 47th St.  
N. Y., NY 10017



## WINDWATCH™ ANEMOMETER—WIND VANE

\$22<sup>95</sup>



Non-flashes in indoor indicator show wind speed and direction. Decorative indicator with gold dial in dark mahogany case. Designed for desk or wall mount. Outdoor instruments of durable aluminum with electrical parts enclosed in rigid vinyl housings. Easy to assemble and install. Attach directly to wall or pole. Comes with velcro and materials for installation up to 400 feet. 12vdc regular 120V AC. Unique low amp circuit assures absolute safety. A fascinating addition to any home. Five years guarantee. 15 day trial. Satisfaction or money back. Only \$22.95 postpaid.

Dept. F3 104 Heilmann  
San Antonio, Texas 78205

## BEST "LEARN-IT-YOURSELF" BOOKS

Handbook of Practical Boat Repair 224 p. 144 v.	\$9.95
Hand Gardening Handbooks—Flycatcher A B C 210 p. 127 v.	\$9.95
Cracks for Kids 182 p. 200 v.	\$7.95
Advanced Applications for Pocket Calculators 300 p. 275 v.	\$8.95
Electrical Wiring & Lighting For Home & Office 204 p. 155 v.	\$7.95
Radio Astronomy for the Amateur 292 p. 80 v.	\$8.95
Amateur Film Making—Index of Sound-Sync Recording 250 p. 118 v.	\$8.95
How to Tune a Radio 224 p. 45 v.	\$8.95
Modern Auto Tune-Up—Mitsubishi Corolla 240 p. 135 v.	\$8.95
Complete Handbook of Lawnmower Repair 434 p. 260 v.	\$9.95
Making & Servicing Electronic Protective Systems 252 p.	\$7.95
How to Repair & Modify Gasoline Engines 288 p. 124 v.	\$8.95
Radio TV Repair 224 p. 107 v.	\$7.95
The Complete Auto Electric Handbook 210 p. 129 v.	\$8.95
Auto Electronics Simplified 256 p. 207 v.	\$8.95
Complete Handbook of Home Painting 210 p. 96 v.	\$7.95
Complete Guide to Outboard Motor Sales Repair 246 p. 126 v.	\$9.95
Computer Technician's Handbook 480 p. Over 800 v.	\$12.95
How to Repair Home/Auto Air Conditioning 208 p. 100 v.	\$7.95
Small Appliance Repair Guides—Vol. 2 210 p. 119 v.	\$7.95
How to Tune a Radio (Everything Electronic) 180 p. 114 v.	\$6.95
Servicing Casio's & Casio's Page Players 294 p. 196 v.	\$9.95
CR Radio Operator's Guide 224 p. 107 v.	\$7.95
4 Channel Stereo from Source to Sound 2nd Ed. 252 p. 102 v.	\$7.95
Professional Picture Fixing for the Amateur 194 p. 134 v.	\$7.95
Using Electronic Testers for Auto Tune-Up 252 p. 206 v.	\$7.95
The Home Appliance Clinic 108 p. 81 v.	\$7.95
Experimenting With Electronic Music 180 p. 103 v.	\$7.95
The Complete Pay-Per-View Radio Handbook 294 p. 114 v.	\$9.95

SEND NO MONEY! We'll invoice you on 15-DAY FREE TRIAL. (Big money up to you!)  
Satisfaction—guaranteed by number of thousands to date. All nationwide books.  
148 BOOKS. Dept. PM-85 Blue Ridge Summit, Pa. 17214



**SILVO**  
(BRAND NAME)  
TOOL  
CATALOG  
Thousands  
of exciting  
tool values!

Stanley, Skill, Thor, Wren, Dixon, Wiss, Wellsaw, Dremel, Plumb, Hult, Kennedy, Channellock, Rockwell, Hefco, Vise-Grip, Crescent, Rigid, Pony Clamps, Unimol, Foreord and many other Nationally Advertised Brands of Tools & Supplies. We ship Coast to Coast at prices Hard to Beat. Send \$1.00 for our big 196 page tool catalog today.

Silvo Hardware Co., PM-75  
107 Walnut St., Philadelphia, Pa. 19106

## MAKE \$25 to 100 PER HOUR

**BADGE-A-MINIT**, a complete badge making system lets you make permanent metal pin back badges for fun or profit. Badge parts cost pennies you sell slogan buttons for up to 75c each, photo buttons for up to \$2.50 ea. Get FREE illustrated money making plans by return mail, or send \$34.95 plus \$1.75 for shipping to RPM Assoc. Ltd., Box 618, Dept PM-85, LaSalle, Ill. 61301

## FUN FLYING! EASY, LOW COST

In the air, on water, on snow—the versatile Benzen Copter is everyman's sport craft. Designed for making with hobbyshop tools. Flying instructions come with step-by-step building plans. Buy Benzen parts as you need them. Start with the colorful \$5 INFO PACKET. Send the coupon now.

SEND \$5 NOW  
BENZEN AIRCRAFT CORP., Dept. PM-85  
ROU Airport, P.O. Box 2746, Raleigh, N.C. 27602  
NAME \_\_\_\_\_  
ADDRESS \_\_\_\_\_



## EXTRA MONEY '30 to '50 A DAY

Operate a community sharpening service with an investment of \$150. Work from your basement or garage. Our manual guides you in professional methods of grinding, of business promotion and in pricing your work.

- Hand Saws • Circular Saws • Knives • Chain Saws
- Scissors • Pinkie Shears • Clipper Blades
- Planer and Dado Blades • Mower Blades

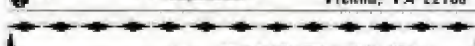
John Rodock says: "Thanks for shipping Model 331. It has paid for itself many times since I purchased it. Please send latest price list on grinding wheels."

TREYCO  
P.O. Box 216-A  
North Tonawanda, N.Y. 14120

START NOW...WRITE TODAY

## JUNGLE TENT HAMMOCK

For Outdoor Comfort—Rainproof Top—  
Mosquito Proof Netting—  
Zipper Side Opening 28" x 74" \$29<sup>95</sup>  
Postpaid PM-8  
check, cash, or money order.  
Tycos Camping Co.  
8344 Leesburg Pike  
Box 302  
Vienna, VA 22180



## DUNE-BUG

Complete plans & specs on how to build or buy a dune, beach, or water, kite, engine, & raw material.



Send \$2 for DUNE-BUG pkg. to:  
Box 987MB, Azusa, Ca. 91702,  
Ph (213) 334-0334

Small Engines Service Manual

Tells and Shows You How to Fix Small Gas Engines on - LAWN MOWERS, Garden Tractors and Tillers, and Power Equipment. Repair your own gas engines. Make Money repairing for others. New 10th edition gives complete information on repairing small gas engines under 15 cu. in. Only universal repair book of its kind. Information on all major manufacturers' engines. Authoritative section on gas engine fundamentals. Trouble shooting and servicing of ignition and carburetor equipment. Illustrated with hundreds of clear and concise exploded drawings. Over 300 pages with practical down-to-earth information for mechanics, and easy enough for a beginner to follow. Satisfaction Guaranteed or Money Back. TECHNICAL PUBLICATIONS Div., Dept. PM-875 1014 Wyandotte, Kansas City, Mo. 64105

## WAREHOUSE DISCOUNTS ON

NATIONALLY ADVERTISED  
• C.B. RADIOS  
• MONITOR SCANNERS  
IN FACTORY SEALED CARTONS  
FIRE POLICE  
BUSINESS - RECREATION - PERSONAL  
SATISFACTION GUARANTEED  
WRITE FOR QUOTE  
ELECTRONICS WAREHOUSE, INC.  
6234 LITTLE RIVER TURNPIKE (DEPT. 4)  
ALEXANDRIA, VA. 22312  
OR PHONE: (703) 258-1300

## NEW FUEL ATOMIZER GASKET

—More than pays for itself in gas savings.  
—Easier starting under all conditions.  
—More complete burning of fuel.  
—Smoother running engine.  
—Faster acceleration—Less pollution.  
—Less spark plug fouling.  
—Less wear and tear for starter.  
Send (cash, ck., m.o.) 30 Day Money Back Guar. (No C.O.D.)  
Specify: MAKE, MODEL, ENG. SIZE  
EKONO COMPANY—PMA  
1 BARREL \$ 8.95 4894 Bedford Avenue  
2 BARREL \$ 9.95 Brooklyn, New York  
4 BARREL \$10.95 11233  
Tax where applicable

## GENUINE ITALIAN LOCK BLADE

DISCOUNT SALE!  
Mirror-polished quality blade opens instantly and automatically locks securely into genuine horn handle.  
BUILT TO LAST A LIFETIME! Reg. \$8.95 val.  
ITALIAN LOCKBLADE, Dept. PM-8  
4535 Huntington Dr. So., Los Angeles 90032



## KARATE

JUDO • SAVATE  
JIU-JITSU  
THE GREATEST SELF-DEFENSE SYSTEM KNOWN TO MAN  
Learn-At-Home-Course reveals hundreds of deadly self-defense secrets, which will enable you to protect yourself from any attacker! Easy to learn! FREE COLORFUL BROCHURE REVEALS SELF-DEFENSE TECHNIQUES  
Send to: UNIVERSAL, Dept. M  
BOX 39303 DETROIT, MICHIGAN 48239







**FREE! POWERFUL MUSCLES FAST!**  
**FREE! FREE!**  
 Fantastic New Discoveries in the science of bodybuilding. Add inches of powerful muscles to arms, chest, shoulders and legs. Secrets on trimming the waist with ultra-modern methods—fast! Results Guaranteed! Send for free brochure!

Universal Bodybuilding Box 435 Dept. M  
 Dearborn, Michigan 48121

**ROUTER BITS**

HIGH SPEED STEEL, CARBIDE TIPPED, SOLID CARBIDE, FORMICA TRIMMERS, PILOTED, ETC. Professional quality tools at lowest cost through mail order. What others call special, we have in stock. Send \$2.25 for catalog and price list to:

TECHNICUT TOOL SUPPLY  
 P.O. Box 233, Newbury, Ohio 44065

**ORIGINAL W.W.II HELMET**

ONLY \$19.95 PLUS \$2.00 POSTAGE & HANDLING  
 (NOT A REPLICA)  
 COLLECTORS! Helmets, Uniforms, Bayonets etc. FREE CATALOG  
**UNIQUE IMPORTS, INC.** Dept. PM1  
 610 Franklin St., Alexandria, VA 22314

**BURIED TREASURE**

Locate from a LONG DISTANCE!  
 with Ultra-Sensitive DIRECTIONAL Locator  
 SEND FOR FREE INFORMATION BROCHURE  
**RESEARCH PRODUCTS**  
 BOX 13481-AM TAMPA, FLORIDA 33611

**SAVE ELECTRIC POWER!**

Save up to 80% electrical power with this unique, inexpensive, portable, permanent and legal method applicable for shops, homes, factories, businesses, farms, sites, 100% Refund Guaranteed if not scientifically sound or if it employs gimmicks.  
 Information \$1.00

**CONSUMERTRONICS CO.**  
 P.O. Box 1399 Alamogordo, N.M. 88310

PLANS AND INSTRUCTIONS FOR

Go Kart	\$2.00
Mini Bike	\$2.00
Mini Car	\$3.00
Pedal Boat	\$4.00
12" Sail Boat	\$4.00
Snowmobile Sleigh	\$3.00
Mini Jeep	\$3.00

Mini Vehicles Plans Dept. C  
 Chevy, N.Y. 13001

**Learn CUSTOM PICTURE FRAMING For Fun Or Profit!**

Let Professionals show you the trade secrets of custom portrait and picture framing. It's a fascinating, satisfying craft—yet a framer's skills are worth \$8 to \$10 an hour or more! Start a clean, quiet business you can easily manage from home in part time—we'll show you how, help you every step. Write for complete details—no obligation and no salesman will call.  
**FREE FRAMING FACTS!**  
**FRAMECRAFTERS, Dept. 4PM, P.O. Box 14 1205 W. Barkley, Orange, CA 92668**

**DISCOUNT SALE \$9.95**

**AIR PISTOL \$7.95**  
 (WITH FREE CAN OF PELLETS) PP  
 IMPROVED MODEL. Built to last a Lifetime. Shoots both pellets and darts. This fine, wall made, .177 cal. German air pistol is just the ticket for target or vermin. Accurate. No CO2 cartridges to replace, either. Once in a lifetime bargain. Order now! Only \$7.95  
 Sagat Leather Holster, \$2.95 ppd. • 500 Deluxe Pellets, \$2.40 ppd.  
 20 Deluxe .177 cal. Steel Darts, \$2.00 ppd.  
**AIR PISTOL, Dept. PAK-1**  
 4935 Huntington Dr. So., Los Angeles, Calif. 90032

**CENTERFOLD HIBALLS**

Most amazing bar glasses ever! Colder the drink, more humid the air... quicker girls shed their clothes. Down to their full, natural beauty! They dress again each time moisture dries. Gift set of 4 different glasses. \$7.95, postpaid. (2 sets \$15.00). U.S.A. only.  
 #411—Set of 4 White Gals.  
 #412—Set of 4 Black Gals.



**H. FISHLOVE AND COMPANY**  
 712 N. Franklin, Chicago, IL 60610

**"OUR FOUNDRYETTE" BLAST FURNACE SINCE 1935**

Hobbyists, Schools, Inventors, etc. Make your own castings of any metal from cast iron, down to lead and zinc. Available in sizes from 1 1/2 to 285 lbs. RED BRASS. Complete units furnished with all sizes. Send 25c for circular.  
**KANSAS CITY SPECIALTIES CO., INC.**  
 Dept. P-B, P.O. Box 193, Middleton, Wisconsin 53562



CARPET DETERGER UPHOLSTERY DETERGER WALL DETERGER

**Use your SPARE TIME beat inflation with added income**

You offer a service everybody needs... work part time or full time... own your equipment... keep all you earn... start with just a small investment... and we help you every step of the way!

Have your own money-making business and make the kind of income you probably thought impossible. You can when you clean carpeting or upholstery or walls with Von Schrader professional cleaning equipment. Every home, every building are potential customers. And every customer can become repeat business. The demand for on-location cleaning is growing so fast that how much you earn depends solely on just your time and effort.

Moreover, we help you every step of the way... just as we have helped thousands of others build money-making businesses for 40 years. Typical comments: "Cleaning is a very good business—have been most grateful for your advice and help. You have fine machines—can recommend them to anyone."—R. Herbst. "Never have we made this good a living and been so

<b>VIDEO WORK SPOONER</b>  \$7.95 \$7.89	<b>DIAL TELEPHONES</b>  \$7.99 \$7.89	<b>POCKET 10,000 OHM/VOLT</b>  \$13.95
---	--	--

**SURPLUS CENTER PM-085** Lincoln, Nebraska Zip Code 68501

**DRILL YOUR OWN WATERWELL**

With this low-priced outfit you can drill your own water well at a cost of about 12¢ per foot! Also, this unit can be operated horizontally to drill free-flowing springs in hill-sides. A big, fact-filled package and 24-page book "How To Drill Your Own Water Well" is just \$1.00 PPD. (Refundable) "WRITE TODAY!"  
**DEEPROCK MFG. CO.**  
 703 Lafayette Pkwy., Opelika, Ala. 36801



WALL DETERGER

**"Let me send you our free booklet that gives all the facts"**  
 —Francis von Schrader, President

Read about the big demand for on-location cleaning, see why Von Schrader Detergers are the finest of their kind, how easy they are to operate. Learn how other men have become financially independent, how Von Schrader helps you every step of the way. Fill in the coupon and send for booklet. **Extra! Special Recorded Message included with booklet.** Listen as Francis von Schrader talks to you personally about your growing future using Von Schrader Detergers.

**Take the 1st step! Mail coupon**

**VON SCHRADER company**  
 40 years of helping people earn good money  
 1086 Plaza, Racine, Wisconsin 53403  
 Please send complete information on Von Schrader Detergers. No salesman will call.

Name \_\_\_\_\_  
 Street \_\_\_\_\_  
 City \_\_\_\_\_  
 State \_\_\_\_\_



## RV KITS!

**BUILD YOUR OWN & SAVE \$\$\$**  
**CAMPERS, COVERS, VANS, TRAVEL TRAILERS**  
**AND 5th WHEELERS**  
**Plans & Full Size Patterns**  
**WRITE FOR FREE CATALOG**  
**GLEN L RVs**  
 9152P Rosecrans, Bellflower, Ca 90706

## A YEAR'S INCOME IN 6 WEEKS

### BLACKJACK PLAYERS

Use my unbeatable, quickly-learned system to win over \$50.00 an HOUR in any casino. Play relaxed. No cards or charts to memorize, and IT WORKS!

• 30-DAY FREE HOME TRIAL •  
 You must be satisfied 100%. No obligation. Get a deck of cards and try it. You'll be amazed.

FREE DETAILS VIA AIRMAIL  
 MEL GRANT, Dept. 279  
 324 So. First Street, Alhambra, CA 91802

## AMAZING NEW ELECTRIC ARC WELDER \$14.95!

There's an **any-better-than** power welder, brakes, holders, cuts all metals! Use any 115 volt house plug in! Multifunction. Welds, repairs, bends anything for cars-factory-home. Complete ready to use with kit of steel, bronze, carbon welding rods. One-switch automatic arc torch. No experience needed!

**SEND ONLY \$2.00**—we ship to you and pay postage \$12.95. Includes 400 postpaid in solid \$1.00 for PP. In U.S.A. Lifetime burnout guarantee—30 day money back free trial! Now, save and make money, drop yours today! Midway Welder Dept. KPM-B, Kearney, Nebr. 68847

## PORTABLE STEAM CLEANER

Stream in 60 seconds

**CLEAN:**  
 Engines, Air Filters, Lawn mowers.  
 3 year guarantee on fire box, coils.  
 Uses liquid soap, propane fired.  
 Weight 120 lbs. Auxiliary pump required on low water pressure.

**WEDCO MFG. INC., Dept. M-6,**  
 Box D, Jackson, Wyo. 83001

## THROTTLE-SPEED CONTROL \$18.95 P. PD.

A quality manual speed control at the lowest prices. You can enjoy luxury driving and benefit from a terrific 15% saving on our safe system will not merge if checked system of straighten burnout. Just a touch of the illuminated switch turns it on. A touch of the brake pedal releases it. 45 min. installation time, out of the way on engine-side firewall. Guaranteed. Fits all 12V. cars and trucks. Send to **PERFORMANCE**  
 Box 129 Westport, Mass. 02790

## SECRET LOANS!

Borrow by mail in absolute privacy. Up to \$3000 from reputable company—founded 1897. No interviews. No co-signers. No mortgages. For full details write:  
**Dial Finance, Dept. 3383**  
 340 S.W. 8th St., Des Moines, Iowa 50309

## 110 VOLT A.C. GENERATORS

60 cycles, 3000 watts. Wt. 27 pounds, 5"x10" Fanbelt driven from car or pickup. Operates T.V. All power tools. Over 13,000 in service. This is our 25th year. Guaranteed 6 months. \$115.50 Postpaid while supply lasts. Our 11200-watt generator needs no battery. Special price—\$105.00 Postpaid.  
**Virden Perma-Bilt, P.O. Box 7160 PM,**  
 2821 Mays, Amarillo, Texas 79109

## BUILD YOUR OWN HIGH PRESSURE WASHER I

**EASY TO ASSEMBLE KITS—MOTOR IS PREWIRED**

Have your own carwash! Powerful 500 P.S.I. output blasts away dirt, grease and grime! Clean trucks—campers—boats—house siding—patios—pools—lawn and garden equipment. Degrease engines. Spray trees. Use with any cleaning solutions, disinfectants or insecticides.

FOR INFORMATION WRITE:  
**P. W. Distributors Inc, P. O. Box 186**  
 Dept. PM McHenry, IL 60050

## NO GASOLINE!

Run your car, truck, motor, boat, or generator on wood, napalm, coal, petroleum... without any carbonaceous material! Proven in hundreds of thousands of vehicles during World War II! Guaranteed!

**JEROME AMES**  
 P.O. BOX 52, Dept. PM  
 DETROIT, MICH. 48223

**FREE DETAILS** Write

## MILITARY STUFF

5000 Products—All New! Mini-Medals, Patches, Flares, Insignia, Fatigues, Rings, Boots—50 Pages! Send 50¢ (refundable). Send \$1 for "AIR MAIL." **KEN NOLAN,**  
 Foxhole 105, Irvine, Calif. 92705.

## IMPORTED LOCK BLADE KNIFE

Get your copy of the new Executak catalog. Send 50c for catalog only.

To Order Lock Blade Knife, specify size and add 25c for shipping and handling.

9" Knife...\$2.75  
 7" Knife...\$2.25  
 5" Knife...\$1.75

**EXECUTEK**  
 777 S. CENTRAL EXP RICHARDSON, TX 75080

## "LISTEN IN" TO POLICE-FIRE RADIO CALLS IN YOUR CAR!

WORKS with ANY CAR—Portable or HOME RADIO! Just PLUGS in—No wiring—3 minute hookup! Switches instantly from regular radio to ALL POLICE-FIRE-EMERGENCY-TAXI-STATE-GOV'T 2 way radio call! Works Everywhere—Anytime! Dual Band 746.40 & 150-175. 500W. **SEND ONLY \$2.00** (cash Ck M.O. and pay postage \$12.00 C.O.D. post.) age or sept \$14.95 for 3rd day in U.S.A. COMPLETE with Antenna and Plug in to use with ANY Home or Portable Radio! Full Instructions—1 year Service Warranty—10 DAY MONEY BACK TRIAL—SOLD ONLY Direct from Factory—WESTERN RADIO DEPT. BPM-R KEARNEY, NEBR. 68847

## INSTANT 110 VOLTAGE POWER ANYWHERE

for cars, campers, trucks, boats w/alternator runs all power tools, fans, heaters. NOT a junction box, but a rugged plastic case. Up to 3000 watts. 3 outlets, safety fuse, voltage lite, U.L. Approved. Install easily in minutes. Great for farmers, sportsmen & emergencies. Guaranteed for the life of your vehicle. ONLY 15.95 postpaid cash, check, M.O. Bank-american or Master Charge w/Exp. date.

**KAL SALES, Dept. PM2 3375 Park Ave., Wantagh, N.Y. 11793**

## Official Popular Mechanics

# PATCH

Collectors item! Quality woven emblem. Red white & blue! 85¢ plus 15¢ handling. Check or M.O. to PM PATCH, Box 1014, H5, Radio City, NY 10019



# THIS LABEL SAYS MORE

Popular Mechanics is far and away the acknowledged authority in the ever-expanding field of do-it-yourself activity. Our readers know the Popular Mechanics tradition of total involvement with leisure equipment, workshop accessories, tools, home and car care supplies—in virtually every area in which do-it-yourself products play a vital part. That's why, when you, the PM reader, see this Product Feature Mark on any product, anywhere, you know that product is a solid member of the growing family of products featured within the advertising pages of Popular Mechanics—a magazine devoted to serving the dedicated do-it-yourselfer for over 73 years.



# CLASSIFIED ADVERTISEMENTS

Rate: \$2.65 per word payable in advance each insertion. Bold face capitalized words—75¢ per word additional (First word set in Bold Face at no extra charge. Zip Code Free). Minimum insertion ten words. To be inserted under proper classification, copy must be in our office by the 10th of the second month preceding date of issue. The next available issue to place an advertisement in America's No. 1 Classified Section is October. The closing date is August 10th.

Send remittance and order to H. E. Kappel, Popular Mechanics, 224 West 57th Street, New York, New York 10019. As a consumer service and in cooperation with our mail-order advertisers who use post office box addresses for their convenience in handling your order, Popular Mechanics maintains a register of such mail-order advertisers containing their complete name and street address, which is available to you upon request.

Please make remittance payable to Popular Mechanics . . . When answering advertisements please use the zip code number

## AUTOMOBILES

**AIR FILTERS** For Limited Space, Maximum Efficiency, Minimal Air Flow Restriction. Washable, Chromed, Foreign, Mini, Domestic Cars. Catalog \$1.00. International Accessories, P.O. Box 414, Burbank, Ca. 91503.

**SAVE Gas-Remove Smog Devices.** Details \$3.00, Ross, Box 5607, Titusville, Florida 32780.

**SANDBLASTERS**, \$32.50—\$749.50. Free Catalog—Truman, 1330 Market, Youngstown, Ohio 44507.

**"50 MPG Carburetors—Do they Exist? Free Details."** Madison, Box 206-5, Berea, Kentucky 40403.

**33% OFF Delta Cdi, Radar "Snapper", Qi Lights, Gauges, Tools.** Free catalog. Time Machines, 29M Falmouth St., Brooklyn, N.Y. 11235.

**SAVE GAS PLUS MORE POWER** With vapor injector. Free Information, Box 53A, Colbert, Wash. 99005.

**REPAIR & RECHARGE AUTO AIR-CONDITIONERS** Illustrated Instructions, ppd. \$5.50 - Ward, 101 Wilson, Hightstown, N.J. 08520.

**MANUALS** For Every American and Imported Car. Free Catalog. Carbooks, 181 Glen Ave., Sea Cliff, New York 11579.

**V-8 RUNS** On 4, 24 1/2 M.P.G. No Pistons Removed. Details \$3.00. Kinney, 2335 N. Milford, Highland, Mich. 48031.

**SAVE Gas, Oil, Plugs.** Details Free. Motaloy, 2532 Superior, Chicago, Ill. 60612.

**GUARANTEED TO SAVE YOU \$15 TO \$50 PER MONTH** Payment on Your New or Used Auto. Buy from any dealer—Finance at any Bank in USA. Book by former BANK OFFICER and AUTOMOBILE DEALER FINANCE MANAGER guarantees to save YOU Up To \$1000 on Your Next Auto or money back. Send \$1.95 to Shelton Taylor, 4112 Oakellar St., Tampa, Florida 33611.

**GUARANTEED MPG boost**, more pep! Gadget fits on distributor—no tools! \$4.95. Cord, Box 76, Bentleyville, Pa. 15314.

**NEW!!** Quik change motor oil and transfer pump, changes oil without getting under Car. Guaranteed! \$12.95. Johnson Enterprises, 305 1/2 E. Hillsborough, Tampa, Fla. 33604.

**ADD PROPANE-BUTANE** To Your Engine. Keep Gasoline Stand-by!! Easy To Follow Instructions For Hand Tools. \$4.95—Guaranteed. LPGs Automotive, Box 2253, Eugene, Oregon, 97402.

**ELECTRIC CAR** 55mph now 250 mile range hybrid, the original, most advanced compact car conversion manual, maintenance free solid state control—\$15.00, pictures, info only \$1.00. SEECOM, Box 1274, Tustin, Cal. 92680.

**1927 BUGATTI Karkitmobile.** Build on VW chassis, \$195 extras included. Fully guaranteed, \$995. Free brochure: Precious Coach Ltd., P.O. Box 601114, North Miami Beach, Florida 33160. Phone (305) 949-4600.

**SERVICE YOUR OWN CAR! BUY POPULAR MECHANICS CAR REPAIR ANNUALS.** Three editions still available 1971 and 1973 and 1974. Price, \$1.00 each. Send Order to: Popular Mechanics, Dept. HE, Box 1014, Radio City, New York, N.Y. 10019.

## MIDGET CARS

**PEDAL CAR KIT.** Sporty New Adult Model! Fun To Drive. Assembles Easily. Complete Kit Brochure \$2.00 (Refundable). Pedal Engine Inc., Box 1648, Largo, Florida 33540.

**YOUR AD IN POPULAR MECHANICS WILL BE SEEN BY** More than 6,000,000 active buyers for your products and services. It costs only \$2.65 per word. And, if you wish to run all or part of your ad in bold capital letters—you can do so for as little as 75¢ per word additional. Act now! Send your Classified ad to: **POPULAR MECHANICS, CLASSIFIED DEPARTMENT, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.**

## AUTO SUPPLIES & EQUIPMENT

**"ALTERNATOR/Generator Rebuilding Book."** Information: Hedelund Engineering, POB 5777, Las Vegas, NV. 89102.

**REVOLUTIONARY Auto Air Conditioner** You can build For About \$50. **SAVE GAS. FREE** Detailed Information. Space Age Research Co., Dept. PMB, Box 770, Columbus, Indiana 47201.

**PARTS:** Army Jeep and truck parts. Spare Parts & Equipment Co., P.O. Box 751, Lexington, Kentucky 40502.

**RADAR Snapper, Auto Accessory Literature.** Fletcher . . . 906M Lindale, Richardson, Texas 75080.

**BURN** Gasoline, Kerosene, Diesel, Alcohol. Increase Performance, Reduce Emissions. Kits \$5.00 up. Franchise's available. Power Gentle, Box 872, Lancaster, Pa. 17604.

**FREE Details. ENGINE OIL TESTER.** Saves Money, Oil, Filter. Protects engine. \$5.95. Battery vitalizer—\$2.48. Distributors wanted. R & W Engineering, 1116 Oakdale Street, West Covina, Ca. 91790.

**MOTALOY** Ring Valve Job while you Drive, \$6.50 postpaid—Two \$12.00—Guaranteed. Andris, Box 34237, Dept. 391F, San Francisco, Calif. 94134.

**CLASSIC T-Bird Metal Repair Panels.** Bob's Auto Body, 88 Ellnor Ave., Akron, Ohio 44305, 216-733-2007.

**SAVE ON POINTS AND CONDENSERS FOR MOST AMERICAN CARS.** POINTS \$2.10. CONDENSERS 80¢. State Make, Year, Engine Size. PAC, Box 729, Brownsville, Texas 78520.

**SAVE! FIBER BRAND Repair Kit.** Autos, Boats, Home Use. Cracks, Dents, Holes; In Wood, Fiberglass, Metal. Guaranteed Quality. Pint \$2.89, Quart \$4.29. Postpaid. Dept. C-3, Craig Associates, 831 Sibley Tower Building, Rochester, New York 14604.

**HOMEMADE Vapor Injector** Increases Mileage. Instructions \$2.00. Vidmar Crafts, Freeburg, Ill. 62243.

**FREE SAMPLE!** Racing stripes, adhesive vinyl, Red, black, white, Low as 25¢ ft. Send stamped, addressed envelope. Specify color, Petmar, Box 911, West Bend, Wisc. 53095.

**UNIQUE** Ignit Continuously Monitors Ignition Performance. Q-ARC, Box 47876, Los Angeles, Calif. 90047.

## MOTORCYCLES, BICYCLES, MOTORSCOOTERS, & SUPPLIES

**GO-KARTS**—\$29.95 send \$1.00 For Catalog and drawings. Schmieder, RD#1, Doylestown, Pa. 18901.

**AMERICAN INDIAN MOTORCYCLE COMPANY, WORLD'S LARGEST** Supply of Parts for AMERICAN INDIANS, 213-447-4078, 119 East Huntington Drive—Monrovia, California 91016.

**HONDA**, \$25.00. Other Bargains. Send \$1.00 (Refundable). Motorscooter, P443, Bend, Oregon 97701.

**MOTORIZE BICYCLES—PLANS!!!** Electric, \$2.00 . . . Gasoline, \$2.00 . . . Both, \$3.00 . . . Guaranteed . . . Britt, 956 Springdale, Atlanta, Ga. 30306.

**REPAIR BICYCLES** For Fun and Profit. Send \$3.00 to Plaza Bike Shop, 1523 Woodside Rd., Redwood City, Ca. 94061.

**MOTORCYCLES.** Mini-Bikes, Tires, Accessories. Wholesale Catalog 25¢. Lorenzo, Danville, Illinois 61832.

**MULTI-PURPOSE BIKE RADIO** With Headlight and Signal Horn, all in one. Fits all Bicycles. Colors—Red, Blue, and Black. Send only \$19.95 Check or M.O. L & M Enterprises, 513 N. Mt. Vernon Ave., Loudonville, Ohio 44842.

**ILLUSTRATED Catalog.** 25¢. Parts and Accessories. Custom and Stock. For Most Makes and Models. Motorcycle Supply, Box 159M, Fairbury, Illinois 61739.

## SPACE, ROCKETS, ASTRONAUTS

**ROCKET** Building Publications Catalog, 50¢. Refundable. Rockets, Box 7274, Long Beach, Cal. 90807.

**MOON PHOTO'S** Other Space Souvenirs World's Largest Catalog. Free. Astrofland Products, Box 234, Merritt Island, Florida 32952.

## AVIATION

**AIRCRAFT QUALITY HANG-GLIDERS. CLOUOMEN GLIDERCRAFT CORPORATION FREE BROCHURE.** 905 CHURCH STREET, NASHVILLE, TENNESSEE 37203, (615) 256-6221.

**AIRBOAT** Propellers, Engines, Hubs, Mounts, Supplies. Corvair, V-W Conversions. Removable Airdrives. Catalog \$1.00. Banks-Maxwell, Box 3301E, Ft. Worth, Texas 76105.

**ULTRA-LIGHT HANG GLIDERS** From world's largest manufacturer. Unsurpassed quality & safety. Rogallo plans—\$5.00. Kits, Complete gliders, Free Rogallo & Icarus Information. Free-Flight, 12424 Gladstone, Sylmar, California 91342.

**BUILD—ONE-MAN JET HELICOPTER.** Easy inexpensive. Detailed plans, drawings—\$5.00. Helicraft, Box 7153, Baltimore, Maryland 21218.

**JET Engine Plans.** Catalog, Builders Newsletter \$1.00, Doyle, Box 310, Montclair, New Jersey 07042.

**ALL About Ballooning.** Handbook \$3.95. Aerostation, Box 141, Long Sault Ontario Canada K7M 1P9

## HOVERCRAFT

**AERO-CAR** Amazing Hovercraft built easily with ordinary tools. Lawnmower engine power. Carries one man plus. Hovers, flies forward, backward, Sideways over land/snow/water. Complete construction plans and brochure. \$5.95. Aero-Projects, Box 5118PM, Clinton, New Jersey 08809.

**HOVERCRAFT Plans** All Sizes Tested Designs Catalog \$1.00. Universal Hovercraft, 1204 Third, Cordova, IL. 61242.

## BOATS AND TRAILERS

**BOAT KITS, HULL KITS, FRAME KITS, PLANS & PATTERNS.** World's Largest catalog, over 300 modern designs for the amateur in fiberglass, plywood, strip planking, steel, aluminum, cement, from 7 to 70 feet. **SAIL-Prams, Day Sailers, Motor Sailers, Ocean Racers** Trimarans, Catamarans. **POWER-Cruisers, Trawlers, Run-a-bouts, Fishing Boats, Kayaks, Inboard & Outboard Hydroplanes, Tunnel Boats.** Also complete boat-building materials, sails, fiberglass, plywood, etc. Send \$1.00 for catalog or \$2.00 for catalog plus boat-building guide to Clark Craft, 16-P, Aqua Lane, Tonawanda, New York 14150.

**FIBERGLASS BUILDER'S MATERIALS.** Lowest factory prices in cloth, mat, roving, resin, epoxy, foam, bronze nails, plywood, mahogany. Send \$1.00 for literature or \$2.00 for literature plus booklet on mold making and "How to" fiberglass. **CLARK CRAFT, 16-P1 Aqua Lane; Tonawanda, New York 14150.**

**BOAT PLANS, FRAME KITS, FULL SIZE PATTERNS** Especially for amateurs. Easy, proven methods, step-by-step pictorial instructions. All boat types 8' to 49'. **Sail - Power - Inboards - Outboards - Jets - Houseboats - Cruisers - Hydroplanes - Trawlers - Catamarans - Ski Boats - Tunnel Halls.** Also fastenings, fiberglass, rigging, hardware, sails, spars, boat trailer plans. "How-to" Books. Send \$1.00 for **HUGE NEW 120-page catalog** plus **FREE "Boatbuilding Supplies"** brochure. Glen L. 9152P Roscreans, Bellflower, CA 90706.

**CANOE!** Kayaks! Factory Direct quality kits, from \$30.00. Many different models. Canvas, hulls. Strongest construction materials. Free literature. Sportscraft, Box 636-P, Allentown, New Jersey 08501.

**FIBERGLASS** Cloth and resin. World's finest cloth and non-run resin, at direct mill prices. Complete line of plastics, silicon bronze and brass screws, save 60%. No sales tax. Boat Plans, Catalog 25¢. Stiles Boat Supply, Box 11P, Linden Ave., Mantua Heights, N.J. 08051.

**FIBERGLASS** Canoes, Kayaks, and Duckboats. Many exciting models. Easily assembled kits. \$49.95 up. Free literature. Riverside Canoes, Box 5595P, Riverside, Calif. 92507.

**FISHING/SURFING/SAILING/POWER DORIES. BROCHURE, PHOTOS; 40 PLANS \$1.00 AIR MAIL \$2.00. TEXAS DORY BOAT PLANS, BOX 720, GALVESTON, TEXAS 77550.**

**NEW 1974 Outboards.** Top Brands! 6HP \$365 . . . 15 \$530 . . . 40 \$685 . . . 50 electric 998 . . . 70 electric \$1200. All sizes, Evinrude-Scott-McCulloch-Parts. Handling \$1.00. Electra Marine, 610 Merrick Road, Lynbrook, NY 11563.

**300 BOAT** Designs, patterns, some kits to 57 Ft. Catalogs: Powerboat (2) \$1.50, sailboat \$1.00. Marinecraft, Box 161-M, Brighton, Mass. 02135.

**BOAT Kits.** Molded Fiberglass. Save money-assemble yourself. Factory molded sections bond into one-piece craft. 20 models—14' to 32' Cruisers, Runabouts, Sailboats. Accessories, motors, trailers. Easy terms. Free catalog. Luger, Dept. BC-75, 3800 West Highway 13, Burnsville, Minnesota 55337.

**FREE Catalog.** Kayaks, Canoes, Sailboats, Pirogues, Fishing boats, Duckboats, Plans, Patterns, 41 models. Outdoor Sports, Box 1213-P, Tuscaloosa, Alabama 35401.

**BUILD A HOUSE BOAT FOR LESS THAN \$1000.** It's a 25 Footer with a graceful vee bow. Best of all, with its 8 ft. beam it's trailerable. Plans \$24.50. Send to: Popular Mechanics, Dept. HE, Box 1014, Radio City, New York, N.Y. 10019.

## CAMPERS AND TRAILER KITS—PLANS

**RECREATION VEHICLE KITS, plans, and full size patterns.** Build your own camper, pickup cover, van conversion, fifth wheel, travel or camping trailer and **SAVE!** Dozens of models for domestic and import vehicles. Prepaid freight special. **HUGE** illustrated catalog includes RV equipment. Send \$1.00 (refundable). Glen L. 9152P Roscreans, Bellflower, CA 90706.

(Continued on next page)



## MARINE EQUIPMENT AND SERVICES

**MARINE** Engines, conversions, parts, equipment. Catalog Free! Stokes Marine Industries, Coldwater, Michigan 49036.

**CONVERT** Auto engines to marine. 68 Page Catalog, 50¢. Lehman Manufacturing Company, 800 Elizabeth Avenue, Linden 4, New Jersey 07036.

## ATHLETIC AND BODY BUILDING COURSES

**WEIGHT** Exercising Equipment, send 25¢ to cover postage for illustrated catalog. Exercising Equipment, P.O. Box 662, Holyoke, Mass. 01040.

**MUSCLE!!!** New Illustrated Bodybuilding Catalogue—25¢. 18483 Brady, Redford, Michigan 48240.

**ARMS, 18+ INCHES IN 90 DAYS** Or Refund!! Revolutionary Arms Specialization, \$3.00—Complete!! (Karate—Free Information) Phenoministics, Box 2810, Gresham, Oregon 97030.

**MUSCLES NEED SUPER FUEL!** Fantastic High-Octane Bodybuilding Diet Secrets. \$2.00 Complete. Bodybuilder's, Box 12022, Pensacola, Florida 32589.

**DYNAMIC MUSCLES! FAST!** No Gimmicks. Free Illustrated Brochure. Inquire: Goliath Enterprises, Box 9331-PM, Wheeling, Illinois 60090.

**ROD FULLER'S** Personalized Male Body Development course with weights. Legal size 20¢ SASE to Box 6652, Burbank, Cal. 91510 for information.

## SPORTING GOODS AND EQUIPMENT

**"HANDMADE EARLY AMERICAN WALKING STICKS** Polished Walnut Finished Wood With Polished Brass Head. A Friend On Your "WALK FOR HEALTH" \$8.95 Postpaid. Mary McMahon, 789 Wiggins Ferry, Creve Coeur, Missouri 63141.

**ARCHERY** Lowest Discount Prices. All top brands. Orders shipped same day received. Money-back guarantee. World's Largest Supplier. Free catalog. Anderson Archery Corporation, Grand Lodge, Michigan 48837.

**FREE CATALOG.** Fishing Tackle, Archery, Hunting and Camping Equipment. Lowest Prices. Cabela's Inc., Dept. S758, Sidney, Nebraska 69162.

**HUGE** Sportsman's Catalog low direct factory prices, fishing, hunting, archery, reloading, camping. Send \$1.00 Refundable. Herfers Inc., Dept. CPM, Waseca, Minn. 56093.

**PERMANENT MATCH** Lighter, Unbelievable, strikes like match, \$1.00 Postpaid. W. Bole, Dept. 18, R1, Box 277, Vicksburg, Michigan, 49097.

**SURFING, SWIMMING, BOATING, DIVING** Pressurized Water Proof Watches Features Not Found in Other Watches. Send \$16.95 to: Flash Gordon's Ship, 6248 Kookea, Honolulu, Hawaii 96825.

## FISHING, TACKLE, LURES

**FINNEY FERRET**—World's only guideable lure. Performance guaranteed. Details free. VanHorn, P.O.B. 452A, Crystal Lake, Illinois 60014.

## EARTHWORMS, LIVE BAIT

**EARN** Money raising fishworms for use! Exciting details free! Oakhaven—56, Cedar Hill, Texas 75104.

**FREE** Literature. Profitable Business Raising Fishworms, Crickets. We Teach you how to Raise and Sell. Write today. Carter Fishworms, Plains, Georgia 31780.

**SOILLESS** Method Raising Worms. Garage Basement, Three Oaks, Dresden, Tenn. 38225.

## HUNTING, GUNS, DECOYS

**PELLET GUNS** And accessories. Sensible, enjoyable shooting anywhere. Finest adult models; satisfaction guaranteed. Free catalog. Write: Air Rifle Headquarters, Grantsville, WV 26147.

## POULTRY & GAME BIRDS

**QUAILS.** Incubators, cages, supplies catalog. Marsh, 14216 Brookhurst, Garden Grove, Calif. 92643.

## RABBITS, CHINCHILLAS, FUR BEARING ANIMALS

**\$300-\$700 MONTHLY.** Raise Rabbits, Laboratory Animals for us. We supply Equipment, Breeders, Instructions. Details 25¢. MP11. Rabbits Of Michigan, Countyline Road, Pentwater, Michigan 49449.

**RAISE** Chinchillas. Guaranteed Income. Illustrated catalog \$3.00. Refundable. DeShon Chinchilla, Route 2H, Roanoke, Indiana 46783.

**\$500-\$1000 MONTH** Plan raising rabbits for us. Free details. White's Rabbitry-PM, Hudson, Ohio 44236.

**AMAZING PROFITS!!** \$10,000 Yearly Raising Rabbits for Wool and Breeding. Send \$1.00 for Details. American Angora, Malta 12, Montana 59538.

**RAISE** Rabbits successfully by knowing facts. 25 cents for 64 page illustrated book describing 25 breeds, housing, breeding, feeding, markets and marketing. American Rabbit Association, 36 Arba Building, Bloomington, Illinois 61701.

**WHY** Not Raise Mink? Information \$1.00 Refundable. Samuel Raines, Pointville Rd., Pemberton, N.J. 08068.

## PETS—BIRDS, CATS, HAMSTERS, ETC.

**PETS,** Reptiles, raccoons, skunks, squirrels. Catalogue 25¢. Trails End Zoo, St. Stephens, S.C. 29479.

## HORSES, LIVESTOCK

**"HOW TO TRAIN HORSES—FREE** Book tells how to break, train, make money with horses. Beery School, 1108, Pleasant Hill, Ohio 45359.

## ELECTRICAL SUPPLIES

**ELECTRIC MOTOR SUPPLIES!** Equipment Plans! Modequip, Box 7266, Kansas City, Missouri 64113.

## ELECTRONICS

**TELEPHONES-EQUIPMENT-SUPPLIES,** All Types. Catalog 50¢. Box 16547, Costa Mesa, California 92626.

**NEW!!** 3 Channel color organ. Actually 12 different color organs in 1. Simple to build for under \$15.00. Dazzling ever changing colored patterns. Complete plans and where to buy all parts \$2.00. Music Art Inc., 136 Belmont, Junction City, Ks. 66441.

## BATTERIES, GENERATORS

**BATTERY** Reconditioning Kit, includes molds, material, instructions. Apex Engineering, 3100 Ramona, Alascadero, California 93422.

## ENGINES, MOTORS, MAGNETS

**REWIND** Car Generator for 110 VAC. Power Plant Plans \$2.00. Schmauss, 1228 East Cass, Tampa 33602.

**MOTORS,** shaded-pole gear, 110-V., 7 RPM, ideal for slow-moving displays, \$16.50 postpaid. Way-Mar, P.O. Box 164, Hartsdale, New York 10530.

**WINDING** Data, 275 motors, \$1.25. Data Company, 512 Kensington, Kansas City, Mo. 64124.

**RUN** Three Phase Motors on Single Phase! Three Methods! New Illustrated Manual, \$3.00 Guaranteed! Lindsay, Box 12-D, Bradley, IL 60915.

**"PRESSURIZED** Hot Air engine. Machine on lathe. Plans \$5.00. Iger, 166 Palm, San Francisco, 94118.

## TOOLS FOR SALE

**ABRASIVE** Supplies—Free Brochure. Blanton Sales, 23507 John R., Hazel Park, MI. 48030.

## MACHINERY, TOOLS, & SUPPLIES

**4" METAL** Cutting Lathe \$54.50. Taig, Dept. D, 15048 Proctor, Industry, Calif. 91746.

**500 SOURCES** Tools, Supplies, Books. \$2.00 Craftsman's National Resource Directory, 4216-V Telegraph, Oakland, Cal. 94609.

**UNIMAT** Lathes-Maximats-Metals-Micrometers. Catalogue \$1.00. Campbell, 1424 Barclay, Springfield, Ohio 45505.

**SMALL** Foundry furnaces, Supplies. Free literature. Pyramid Products, 3736 South 7th Avenue, Phoenix, Arizona 85041.

**MILLING** Cutters, lathe milling attachments. Catalog \$1.00. Potter, Box 73, Cedar Rapids, Iowa. 52406.

**BANDSAW** BLADES. Any Size. Free catalog. Parker, R4, BX735, Sonoma, Cal. 95370.

**POWER TOOLS**—Coast to Coast at prices hard to beat. Rockwell, Skill, Milwaukee, Stanley, Miller Falls, & many other top quality lines. Send \$1.00 for catalog today. Also qualify for our special of the month sales for one year. Doro Sales, Inc., 928 Little East Neck Rd., West Babylon, L.I., 11704, Dept. 1.

**PLANS,** Tube bender, Press, Break, Info., P. O. Box 56, Campo, Calif., 92006.

**ABRASIVE BELTS** BELOW WHOLESALE on 100 belts or more. Tell us length, width, grit required. SCHAFFNER'S, PM875 SCHAFFNER CENTER, PITTSBURGH, PA. 15202.

**1400 CATALOGS** Listed and Described! Sources for EVERYTHING Imaginable! Rush \$2.00. MASTERLOG, Box 24413-VU, Oakland, California 94623.

**METRIC SYSTEM** COMING SOON! Every Mechanic Handyman Student Needs Pocket-sized Slide Chart! CONVERTS U.S. TO METRIC INSTANTLY! Weight, Volume, Speed, Length, Area, Temperature, Energy, Pressure; Satisfaction Guaranteed; Promptly mailed PPD.; Send \$1.49 today, SLIDE CHART, Dept. PM875, P. O. Drawer P, Clarence, N. Y. 14031.

**DRILLPRESS.** Unique Design. Anyone can build with used material for as little as \$27.00. Details & Plans \$3.00. Tools & Machines, Box 19331, San Diego, Calif. 92119.

**LARGE** Assortment Flat or Round Head Wood Screws \$10.95 Catalog 60¢ Nuts, Bolts, Screws, Washers, Assortments, Nutty Co., Box 1576SMS, Fairfield, Conn. 06430.

**FOUR** in one ratchet screwdriver set, \$5.00. Southwestern, 2750 Simmons, Abilene, Texas 79601.

## BUFFING & POLISHING

**ABRASIVE** Belts, abrasive flapwheels, buffing compound, buffing wheels. Wholesale catalog and how to use. \$2.00 Refundable first order. Schaffners, PM8 755, Pittsburg, Pa. 15222.

## WELDING, SOLDERING, PLATING

**ELECTROPLATING** Equipment, Portable Platers, Supplies, and "Know-How." Build your own tanks for nickel, chrome, etc. Easy-to-install PVC liners. Rectifier components—all sizes. Schematics, parts lists, formulas, operating instructions for all-plating. Guaranteed to save you 25%-75%. Some good used units for sale. Free Details. Platers Service Company, 1511-PM Esperanza, Los Angeles, California 90023.

## GOVERNMENT SURPLUS

**FREE!** Nationwide Surplus Data List. **WRITE TODAY!** **NATIONWIDE AUCTIONEERS,** Box 872PM, Anoka, Minnesota 55303.

**"U.S. GOVERNMENT SURPLUS DIRECTORY."** How. Where to buy 100,000 items (including Jeeps) . . . low as 2¢ on dollar! Most complete information available . . . \$2.00. **SURPLUS DISPOSAL,** Box 6586-AH, WASHINGTON, D.C. 20009.

**GOVERNMENT SURPLUS,** How and Where to buy in your area. Send \$2.00. **SURPLUS,** 30177PM **HEADQUARTERS BUILDING,** Washington, D.C. 20014.

**1975 SURPLUS** Army, Navy Store, 56 Page Illustrated catalog, Send \$1.00. Ruvel, 3037 North Clark, Dept. 8-J, Chicago, Illinois 60614.

**JEeps** \$52.40. Airplanes \$75.01. Typewriters \$6.70. Boats \$7.50. Typical Bargains Available Nationwide. Sales Directory And Surplus Catalog \$1.00 (Refundable). Midwest Surplus, Box 401-PM, Dayton, Ohio 45401.

**JEeps!!! PICKUPS!!** 100,000 items direct from government. Your area. Latest information & surplus categories \$2.00 **MONEYBACK GUARANTEE.** Order manual #151, from "Dependable Products", Box 113, Vista, California. 92083.

**JEeps** From—\$52.50; Typewriters from—\$4.15; Cars from—\$31.50. Walkie-talkies, motorcycles, airplanes, boats. Typical "As Is" bid bargains from Uncle Sam. Tremendous variety. Exciting free list. Write Enterprises, Box 402-X115, Jamaica New York 11430.

**GOVERNMENT LANDS** FROM \$7.50 ACRE! Vacationing, Farming, Investment! Exclusive "Government Land Buyer's Guide" . . . plus "Land Opportunity Review" listing lands throughout U.S. Send \$2.00. Surplus Lands, Box 6588-AH, Washington, D.C. 20009.

**GOVERNMENT** Surplus Bonanza—Information! P.O. Box 502E, Pasadena, Texas 77501.

**FREE!** Over 10 Surplus Catalogs Every Week Direct from the Government. Complete details \$2.00. Satisfaction Guaranteed. Stephens, Box 3541, Reno, Nevada 89505.

## HOBBIES AND COLLECTIONS

**COLLECT** Military Medals. List 50¢. Vernon, Box 387PM, Baldwin, N.Y. 11510.

**AUTOGRAPHS**—Letters, Documents of Famous People, Bought and Sold. Monthly Catalogs issued. Neale Lanigan, Box 133, Fairview Village, Pa. 19409.

**COLLECTORS!** Original WWII German Helmets, \$21.95. Other military collectibles. Free Catalog. Unique Imports, Dept. PM, 610 Franklin Street, Alexandria, VA 22314.

**SEA** Shell Starter Collection, \$4.95. Allace, Box 628, Montreal, Canada, H3C 2T8.

**"COLLECTORS SERIES"** Airplanes, Automobiles, Railroad Prints Ready for Framing. Send \$1.00 For Catalog of These Beautiful Lithographs. "Collectors Series" PM, 161 W. Harrison, Chicago, Illinois 60605.

**FREE** Bargain list for Butterflies, Beetles, Seashells, Minerals. Collectors Wonderland, Dept. 15, Box 1170, New York 10006.

**"APACHE"**—Authentic Fine Stone Arrowhead Collections. 25-\$5.50, 100-\$15.00. Tribal Hall-S, Apache Junction, Arizona 85220.

**THE HOBBY OF KINGS.** Send \$2.00 for beautiful illustrated catalog which could launch you into the exciting world of **MODEL SOLDIERS.** Not toys but perfect miniatures of historical militaria. **GUARANTEED** to build pleasure, pride and knowledge. **EXECUTER**—Box #38184, Dallas, Texas 75238.

## DECALS, EMBLEMS, PATCHES

**CUSTOM** Designed Embroidered Emblems, Decals. Inexpensive. Free Catalog, details. Southern Emblem, Box 8PMB, Toast, North Carolina 27049.

**DECALS**—Wildlife—Dogs—Horses. Send—10¢ for Free Folders. PM, Tyler, 1301 Methuen Street, Dracut, Mass. 01826.

**EMBLEMS,** Patches, Beautifully Embroidered. Made To Order From Your Design. Low Cost, Fast Service. Free Catalog With Design Guide. Donalyn Creations, Box 247PM, Cliffside Park, N.J. 07010.

## STAMP COLLECTING

**75 DIFF. CHINA**—Only 10¢! Scarce, genuine postage stamps (Catalog Price Guaranteed Over \$6.00!) from all 3 Chinas: pre-1950, Nationalist China (Taiwan), plus Communist China. Ancient mysteries, modern marvels, Mao, Great Wall, etc.—this valuable collection only 10¢! Also, other exciting stamps to examine free. Buy any or none, return balance, cancel service anytime. Plus Wonderful Illustrated Catalog! H. E. Harris, Dept. A-273, Boston, Mass. 02117.

**NOW 50 IRAQ** 10¢ with Approvals. Box 307, Goshen, N.Y. 10954.



## STAMP COLLECTING

(Continued from preceding page)

**YOURS FREE! 40 RED CHINA** Postage Stamps banned to American collectors for a generation by U.S. Gov't. Now at last you can legally own them; and these stamps are so worth having that experienced and beginning collectors alike want them—so act fast, b'cause supplies are strictly limited! You also get 110 other stamps from Britain's Lost Empire plus illustrated Album to keep as a Bonus should you buy \$2 from our Approval Selection. Or return Album and 110 stamps with selection and buy nothing. Cancel service anytime. But Red China stamps are yours to keep! Send 10¢ for mailing while supplies last. Kenmore, Milford RC-154, New Hampshire 03055.

**WOW! 110 ALL DIFFERENT GERMANY 10¢.** Commemoratives, Airmails, High Values, Big Catalog, bargain lists. Also, fine stamps from our approval service, which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. A85PM, Jamestown, N.Y. 14701.

**TOPS! 100 Popular Poland Stamps** (all different) only 25¢. Mystic, Dept. PS 1, Camden, New York 13316.

**OUTSTANDING** Mint complete set approvals sent to serious adult collectors. Bergman, Box 231, Waymouth, Massachusetts 02188.

**1938 LIBERIA** Air Mail—25¢ with approvals. Duke's Stamps, Box 16908, Lubbock, Texas 79490.

**SENSATIONAL** Clearance. Forty Different Packets \$1.00. Norge, Wyckoff, N.J. 07481.

**FREE! BIG BARGAIN CATALOG—NEW EDITION** Listing thousands of bargains including U.S. & B.N.A. stamps, packets, albums, accessories and supplies. Also, fine stamps from our approval service which you may return without purchases and cancel service at any time. Jamestown Stamp, Dept. E85PM, Jamestown, N.Y. 14701.

**50 DIFFERENT U.S. COMMEMORATIVES 25¢** Fine Used U.S. Approvals Accompany. Craig Stamps, Box 425-N, Bellmore, New York 11710.

**TURKEY—50 different 10¢.** Hicop Approvals, Box 505, Norristown, Pa. 19404.

**SEND** only 5¢ for Worldwide Collection of over 50 different Singapore, Granada, Chad, etc. Contains old and new issues, sports, animals, etc. You will also receive interesting Lists and Certificate worth 50¢ toward purchases. Goliath Co., Dept. TP-1, Bethlehem, N.H. 03574.

**3 VALUABLE** American First Day Covers \$1.00, 7-2¢.00. Postal Heritage, Box 2, Greenville, Pa. 16125.

**FREE! 25 Worldwide** to Approval Applicants. Weller, 34447-28 Yucaipa, Yucaipa, Calif. 92399.

**100 DIFFERENT** British Empire 10¢. Approvals. Gibson, Box 34, Lansdowne, Pa. 19050.

**PHILATELIC** property remainder clearance! \$40.00 worth of fine high value stamps, plus 1000 different miscellaneous unpriced postage stamps. All for only \$10.00. Order Now! Shipped first class registered. Money back guaranteed. Eric's Stamps, Box 1444-B, Kitchener, Ontario, Canada.

**COLORFUL** Miniature set of 8 only 10¢. Approvals. Gorfiz, Box 76457 PM, Atlanta, Georgia 30328.

**ANIMAL KINGDOM!** Fifty different 25¢. Pictorial Approvals included. Edmund Molzan, Drawer 2276, Alameda, Calif. 94501.

**65 DIFFERENT NUDES \$2.00.** 80 Diff. \$3.00. No Approvals. Kemp, 9952 Tamarack, Pacoima, California 91331.

**JAPANESE COMMEMORATIVES—pictorials.** Mint complete sets cataloging over \$10.00 only \$2.00 with accompanying mint approvals. Satisfaction guaranteed. Pagoda, Box 132P, Sidney, Ohio 45365.

**FOREIGN Approvals!** Gigantic values! 3¢ each. ABC, Dept. 3301-A, Box 6000, San Francisco 94101.

**FRANCE #1100—\$4.95** each. Israel—1974 Jerusalem Exhibition—3-8/5 \$4.00 Set. Limited Quantity. Want Lists Solicited Europe 1964 to date. Mint only. Franklin, P.O. Box 467-PM8, Jamaica, New York 11434. Money Order Only.

**20 HISTORICAL** U.S. Commemoratives 20¢, U.S. Approvals accompany. **PINTO STAMP CO.**, Box 111, Park Ridge, Ill. 60068.

**50 YEARS** Old, fifteen different United States, over fifty years old—25¢ with approvals. Jaxon, Box 145-P, Brooklyn, New York 11230.

**SINGLE STAMPS 2¢** and up. Mounted in books. **TRUST STAMP COMPANY**, P.O. Box 100-P, Jamaica, New York 11435.

**FREE** Surprise collection sent with approvals. Gould, 1784 Union, San Francisco 94123.

**PENNY!** Approvals! Regardless catalogue! Kloster, 4164 52nd St., San Diego, Calif. 92105.

**BUILD** Large U.S. Collection Economically. Sherman, Box 15355G, Philadelphia, Pa. 19111.

**MYSTERY** Packet. \$9.00 Catalog Value. Only 35¢. Stamps, Box 27, Fremont, Michigan 49412.

**500 DIFFERENT** Stamps. \$1.50. Smith, 508-A Brooks. College Station, Texas 77840.

**100 OLD** United States between 1881 and 1939. \$1.00. Ed Roush, 423 Shepard, Mansfield, Ohio 44907.

**U.S. BARGAIN**, 50 Different 25¢, with beautiful worldwide, approvals. Stamp Center, Kennebunk, Maine 04043.

**RUSSIAN** Space Collection 50¢, including Russian Approvals. Snedco, Walldwick, New Jersey 07463.

**TEN** Different Nudes! 20¢. Approvals. Stamp Farm, 2M81, Oxford, Wis. 53952.

**100 DIFFERENT** United States Commemorative, 50¢ with Discount Price List. Shelton, Box 547C, North Miami, Fla. 33161.

**SCARCE** Guinea UN Airmails \$2.25, catalog 25¢. Approvals. Stamphaus, box 533, Salisbury, Mass. 01950.

**U.S. MINT** Specials! Flag Set complete \$1.50. 1¢, 2¢, 3¢ Famous Americans (21 different) \$1.50. Free List. Brooks, 2601 Avenue "U", Brooklyn, N.Y. 11229.

**"INVERTED Error"** Dag Hammarskjöld, 10¢ with approvals. Belmont Stamps, Washington, D.C. 20015.

**VIETNAM** 25 Different 10¢ approval. Sam Chazen, Box 95, Ozene Park, N.Y. 11417.

**110 DIFFERENT** U.S. Commemoratives. \$1.00. Stamps, 7607 Larchview Drive, Dallas, Texas 75240.

**50 DIFFERENT** U.S. Stamps, includes 1943 Hag stamp of occupied nations. Only 35¢. Approvals included. Willitt Co., Box 338-C, Yorktown Heights, N.Y. 10598.

**OLDER U.S. ON APPROVAL. SURPRISINGLY GOOD SELECTIONS FOR ADULT COLLECTORS. RIVERTOWN, BOX 180P, LOWELL, MICHIGAN 49331.**

**FREE** Mint Philippines with Approvals, Chapmans, Box 487-P, Galesburg, Michigan 49053.

**WORLDWIDE** New Issues—Free Weekly Illustrated Lists. Brooks, 2601N Avenue "U", Brooklyn, N.Y. 11229.

**STEEL STAMPS.** Multicolored Paintings printed on USS steel foil. Mint set from Bhutan, 25¢. Topical Approvals. LeBlanc, Box 110P8, Glen Cove, New York 11542.

**OLYMPIC GOLD COIN STAMPS, 25¢.** Beautiful mint set, embossed coin-shaped stamps from Sanda Island. Topical approvals. LeBlanc, Box 110-P10, Glen Cove, New York 11542.

**WORLDWIDE** Commemoratives. 25 Different 25¢. Approvals. Wilson, Box 116, Dollard des Ormeaux, Quebec, H9G-2H5 Canada.

**50 DIFFERENT** Old U.S. Revenue Stamps \$1.00. Winchester Stamps, Box 3592, Mansfield, Ohio 44907.

**"WHOLESALE" U.S.—Foreign** Pricelist and catalog Free! Everything Guaranteed. Schneider, Box 1240, Grand Rapids, Michigan 49501. "We accept Master Charge."

**MIXTURES 2¢** Each. Pickrell, Box 10P, Bohannon, Va. 23021.

**WORLDWIDE** 500 Different \$1.00. Nickel Approvals Accompany. Files, Box A-6P, Thornville, Ohio 43076.

**CZECHOSLOVAKIA 50;** 10¢ Approvals. Lee Stamp Company, P.O. Box 461, Gudahy, Wisconsin 53110.

**FREE LISTS!** Discount prices. U.S. Plates, Singles. Scotto, Box 3100-470855-PM8, Miami, Fla. 33147.

**U.N. 9** Different Mint Sets \$1.00! Approvals. Gordon Davison, Hillsboro, New Hampshire 03244.

**100 DIFFERENT** U. S., Some 80 Years Old, 10¢. Approvals Bonus Stamps, Box 385, Midlothian, Va. 23113.

**FROM FIVE CONTINENTS** 100 Different stamps. All Yours for Only a Dime with request for our Beautiful Approvals to Buy or Return. Send 10¢ to Stampac, Box 12005, San Francisco, California 94112.

**200 WORLDWIDE** Stamps 10¢. Approvals. White, Box 24211-JD, Indianapolis, Indiana 46224.

**THIRTY** Uncommon world 40¢. Approvals. J & E, Box 2126, Sunnyvale, Ca 94087.

**MAILORDER** Stamp Dealing. Complete manual \$5.00. Fleck, 29-PM Colonial, Roselle, NJ 07203.

**"CIRCUS EXTRAVAGANZA"** performing Tigers, Elephants, Horses—Monaco's latest Commemoratives—Free! Approvals plus 101 Bonus Sets. William Deems, 226 Race, Ravenswood, West Virginia 26164.

**FREE "Space,"** with packet approvals. Sunset Stamps, 33 Majorca Drive, Rancho Mirage, California 92270.

**16 DIFFERENT** Nudes! 15¢. Approvals. Stamp, Box 212A7, Rosedale, New York 11422.

**SEND** 10¢ for big illustrated catalog of United States, Canada, Newfoundland & United Nations Stamps. Unlike any other. Sundman Brothers, 253 Union St., Dept. RT-1, Littleton, NH 03561.

**FREE! 55** Triangles, Space, Others! Approvals. Baird, PM-42, Box 8128, Portland, Oregon 97207.

**FREE** Beautiful Mystery Set with Approvals. Stamps, 640 Eddy, San Francisco, Cal. 94109.

**FREE** Mint U.N. with approvals. Stamps Unlimited, Box 2295, Kalamazoo, Michigan 49003.

**10 QATAR** Stamps Free—Approvals, W-B Stamps, Wilkes-Barre, Pa. 18703 Dept. PM

**207 DIFFERENT** Triangles, Topicals, etc. Value \$7.00. Only 25¢. Approvals. Free catalog and coupon worth \$1.00. Jayto Stamps, Port Huron, Michigan 48060.

**BETTER GRADE U.S.,** Canadian Stamps for advanced collectors. Borgen, Box 645, Seiad Valley, Calif. 96086.

**LOOK!** 300 Worldwide Stamps, 25¢ with Approvals. Scenic Stamps, Box 1873G, Vancouver, Wash. 98663.

**225 DIFFERENT** Worldwide: 25¢. Approvals. Tibbets, 8675 Meadow, Downey, California 90242.

**FREE** New used Congo animal set. Approvals included. Alpaughco, Box 225, Highbridge, N.J. 08829.

**EISENHOWER, TRUMAN** or **LYNDON B. JOHNSON** Memorial Stamp on lovely, official, First Day Cover addressed any name of your choice, 60¢ each—all 3 for \$1.50. K. M. WALSH, Box 308AA, TUCKAHOE, N.Y. 10707.

**PICTORIALS** Collection! Fifty Different, 10¢. Approvals. Ross, Box 564-M, Yonkers, New York 10702.

## COINS, TOKENS, CURRENCY

**SEND** 10¢ for New Edition valuable Guidebook "HOW TO COLLECT COINS." Also included, 5 foreign coins from Turkey, Spain, etc., and, best Coins and Supplies Catalog in America. Littleton Coin Co., Dept. VB-1, Littleton, N.H. 03561.

**FOUR** Buffalo Nickels Lists—\$1.00. Park Coin, 4400 Excelsior Blvd., Minneapolis, Mn. 55416.

**4 BUFFALOS** \$1.20—Or List 25¢. Rongo, 1265-81 Street, Brooklyn, New York, 11228.

**BICENTENNIAL COLONIAL BANKNOTES** Each dated 1776. Authentic replicas of original money, 7 different. They look and feel 200 years old. Ideal for framing. Send \$2.00 to Educational Enterprises, Box 4296, East Providence, Rhode Island, 02914.

**COINS** At Discount Prices! Free Brochure. Gene Carlton, Chandler, Okla. 74834.

**SILVER DOLLARS** Uncirculated, 1880-81—1883-84-85 \$10.00 Ea. Catalogue 50¢. Shultz, Salt Lake City, Utah 84110.

**FREE:** Lists of Thousands of Stamps and Coins. No Approvals. Bryson, 612M White, Toledo, Ohio 43605.

**U.S. COIN-filled** barrel bought from old-time collector! All dated from 1880's to World War 2! Mixed "grab-bag" style. Includes old-type nickels, dimes, early Lincolns & Indians, etc. Sample sack of 25-55; bag of 100-\$18. Centre Coin Co., Box 1, Dept. B, Sherman Oaks, Calif. 91413.

**10 DIFFERENT** Indian Pennies, \$8.75. Free Coin Catalog. Village Coin Shop, Dept. P, Plainstow, N.H. 03865.

**SILVER** Coins, U.S. Mercury Dimes—50¢. Roosevelt Dimes—38¢. Washington Quarters—85¢. Lance, Box 1433, Flagstaff, Ariz. 86001.

**GOLD** Plated coins, below wholesale, ECS, Box 1087, Manitou Springs, Colorado 80829.

**GOLD COINS** Of the World. Beautiful Low Prices. Plus thousands of United States Coins. Free price list. Please send long, airmail envelope. Self-addressed, stamped. Silver Center, Box 22171-M, San Francisco, California 94122.

**INDIAN** Cents 11 Diff. \$7.95 23 Diff. \$16.95. "S" Mint Lincolns Before 1955 100-35.95 500-\$25.00. Coins, 20929 Ventura Blvd., Woodland Hills, CA 91364.

**MERCURY** Dimes - 2 different, \$1.00. Free lists. Farley Coins, Metamora, IL 61548.

## ANTIQUES, RELICS, INDIAN GOODS AND CURIOS

**10 BEAUTIFUL** Arrowheads \$3.00. Guajardo's, 8713 Shaver, El Paso, Texas 79925.

**INDIAN** Relic list, Arrowheads \$4.00, doz. Folsom, \$5.00 each. C. Sechrist, Deerfield, Missouri 64741.

**SELLING** 10,000 Indian Relics, Arrowheads, Knives, Spearheads, Scrapers, Etc. List Free. Lear's, Glenwood, Ark. 71943.

## MODELS—CARS, SHIPS, TRAINS, PLANES, ETC.

**SHIP** Model Kits, Plans, Fittings from our own Workshop. Big Illustrated Catalog: 75¢. Bluejacket Shipcrafters, 145-V Water Street South, Norwalk, Conn. 06854.

**SHIP** Model Kits, fittings, plans, books, tools, engines, motors. Illustrated catalog 75¢. Mass. residents add 3% tax. James Bliss & Co., Dept. SM, Route 128, Dedham, Mass. 02026.

**MODEL** Airplanes—Big 220 Page Catalog \$1.50. Sig Company, Montezuma, Iowa 50171.

**LIVE** Steam powered backyard railroads! All sizes. Complete "bolt-together kits," and rough castings. Excellent drawings. 100 page catalog \$2.00. Little Engines, Lomita, California 90717.

**SHIP** And Airplane model kits catalog 25¢. Scientific, Inc., 340 Snyder, Berkeley Heights, N.J. 07922

**"SHIP** And Yacht model fittings: Pine construction hull kits; blueprints. Send \$1.00 for illustrated catalog. A.J. Fisher, Inc., 1002 Etowah Avenue, Royal Oak, Michigan 48067."

## MAGIC TRICKS, JOKES, VENTRILOQUISM

**PROFESSIONAL MAGIC!** Direct From Factory To You. Giant 1975 Catalog - \$1.00. Refundable With First Order. Hank Lee's Magic Factory, 35 Hillside Avenue, Medford, Massachusetts, 02155.

**MAGIC!** Amaze, Mystify, Entertain! Large Catalog 25¢. Hundreds of Best Tricks for Stage, Pocket, Parlor. Jeffries Magicland, Dept. 11, Dallas, Texas 75201.

**FABULOUS** MAGICS New 1975 Catalog 50¢. Our Specialty Orders Shipped Same Day. No Substitutes. Fabulous Magic, 3319 East Charleston, Las Vegas, Nevada 89104.

(Continued on next page)



## MAGIC TRICKS, JOKES, VENTRILOQUISM

(Continued from preceding page)

**VENTRILOQUISM!** Information free. **EXCITING FULL COLOR DUMMY CATALOG**—25¢. Maher, Box 420PM, Littleton, Colorado 80120.

**TWO!** Different Magic Catalogs 25¢. Miami Magic, 9734 Bird Road, Miami 33165.

**COMPLETELY Illustrated catalog**, 84 pages, 25¢. Manhattan Magic, Box 334-M, N.Y.C. 10011.

**WORLD'S** Finest professional magic tricks, Joker's Novelties. Giant Illustrated catalog 25¢. Top Hat, Evanston, Illinois 60204.

**WOW!** Magic, jokes, Largest selection. Amaze, mystify friends. Super Giant Catalog 25¢. Abracadabra-MP, Rahway, New Jersey 07065.

**GENII**, The International Conjurers' Magazine, P.O. Box 36068M, Los Angeles, Calif. 90036. Monthly Since 1936. Sample \$1.00. 1 year \$10.00. Not sold on newsstands. None free.

**FREE!** World's leading novelty catalog. 1600 Fun-makers, Jokes, Tricks, Science, Sports, Hobbies, Jewelry, Psychodella. Johnson-Smith, C-4, Mt. Clemens, Mich. 48043.

**BE A Magician!** Two booklets explaining 156 tricks plus large professional catalog. \$1.00. Magic, Inc., 5082 Lincoln, Chicago, Illinois 60625.

**FREE 1975 Magic Catalog** plus gift certificate! Imperial, Box 623-P, Worcester, Massachusetts 01601.

**VENTRILOQUISM!** Catalog of Dummies, Courses, Scripts \$1.00. Magic! Booklet of 25 Tricks \$1.00. Show-Biz Services, 1735 East 26 Street, Bklyn, N.Y. 11229.

**VENTRILOQUISM. MAKE MONEY** With Our Amazingly Life-Like Professional Dummies. Free Brochure. Handcrafters, 2313 West 91st, Chicago, 60620.

**DOLLAR Gets \$2.00 Trick and Exclusive Catalog.** Magic, 1218 Westcott, Syracuse, N.Y. 13210.

**BE A MAGICIAN!** Mystify. Amaze. Giant Magicians Catalog, 50¢ plus **FREE** trick. Universal Magic, 256 South Robertson-MP, Beverly Hills, California 90211.

## BOOKBINDING

**FREE!** "Do-It-Yourself Bookbinding Folder." Peeler Co., 308 Agnew, North, Bonham, Texas 75418.

## BOOKS, CATALOGS, NEWSPAPERS

**BOOK BARGAINS.** All Subjects. Many unavailable anywhere else. Free fascinating catalog. Acropolis, Box-5A8, West Berlin, N.J. 08091.

**"BRAINPOWER"** \$1.00 to: Hooks, Sr., P.O. Box 8, Lebanon, Ill. 62254.

**NATIONAL Geographic Magazines**, 1888-1971, any issue. Buxbaum, Box 465-PM, Wilmington, Delaware 19899.

**FREE Book.** Prophet Elijah Coming Before Christ. Megiddo Mission, Dept. 63, 481 Thurston Road, Rochester, N.Y. 14619.

**BACK ISSUE MAGAZINES**, 200 Titles 1890-1974. Everybody's, 317 West Sixth Street, Los Angeles, California 90014.

**CLOCK And watch repairing books, tools, materials.** Free catalog. North American, Box 77AHA, Fox River Grove, Illinois 60021.

**BOOKS**, how to, self improvement. 40/\$3.00 List 25¢. Gunning, Box 457PM, Rd #8, York, Pa. 17403.

**PUBLISH Your Book!** Join our successful authors: publicity, advertising, promotion, beautiful books. All subjects invited. Send for Free manuscript report and detailed booklet. Carlton Press, Dept. PM7, 84 Fifth Avenue, New York 10011.

**LOW COST BOOKS**, Manuals, Directories, Free Information, Books, Box 60538, Nashville, Tennessee 37206.

**FREE!** List of low cost Popular Books, Success, Happiness, Personality, Wealth, Personal Problems. Walter Dilly, 288 Woodland Avenue, Woodburn, Oregon 97071.

**FREE List of Energy Books.** High Energy Technology, Box 423, Bayside, NY 11361.

**VETERINARY Guide to Farmers.** The only book of its kind. Send \$6.95 to: **POPULAR MECHANICS**, Dept. VG, Box 1014, Radio City, New York, N.Y. 10019

## PLAYS, SONGS, MANUSCRIPTS

**COUNTRY-WESTERN Songs-Poems** wanted for recording. Ballads, rock, gospel, etc. Outstanding Offer. Monthly Awards. Send new song material to Country-Western Recording, Box 523 (PM), Quincy, Mass. 02169. Talent Co.

**SONGWRITERS**—Big money in musical jingles! Huge market! Immediate payment plus residuals! Details, stamp, Northern States Publishing, 902-A W. Badger, Madison, Wisconsin 53713.

**WANT Your book published?** Learn how—we publish, advertise, promote, distribute. Many successes. Free booklet PM. Vantage, 516 W. 34th Street, New York City.

**SONGS-POEMS** Wanted for recording. Best Offer. Monthly Awards. Fabulous \$1,000.00 Offer. Talent 17 (PM) Longwood, Quincy, Mass. 02169.

**SONGWRITERS.** Want help placing songs? Write for free details. Publications, Box 328-PM, Nashville, Tennessee 37202.

**SONGWRITERS LOOKING for CO-WRITERS** on 50-50 basis. HAS songs recorded by BRENOA LEE, EDDY ARNOLD, and others. SEND lyrics to: NASHVILLE CO-WRITER PLAN, BOX 1152, NASHVILLE, TENNESSEE 37202.

**SONGWRITERS.** Present your songs to publishers like professionals. Also who, where, how. Informative booklet. \$3.00. Sunsound, 256 S. Robertson, Beverly Hills, CA 90211.

## BUSINESS SERVICES

**MAILING LISTS** For Small and Large Businesses. Current & Complete. Catalog 50¢. D. M. Inc., Waseca, Minn. 56093.

**TOP Notch Mailing Lists.** Free Details. Community Printing, 1617 Broad St., New Castle, Ind. 47362.

**MAILING LISTS** For Small and Large Businesses. Current & Complete. Free Catalog. D.M. Inc., Waseca, Minn. 56093.

**EARN BIG MONEY! \$1.60 X ENVELOPE. COMPLETE INFORMATION. RUSH #10 ENVELOPE STAMPED. REY, 145 SO. LINCOLN, FT. BRAGG, CA. 95437.**

**MANUFACTURERS** Located for \$5.00 per product or service. V. Hamme, 711 Linden, York, Pa. 17404.

**MAILORDER RECORDS** Help get increased business! Complete 32 Page Record Book shows your inquiries, orders, advertising, expense, etc. Only \$1.00. M. E. KAPPEL, POPULAR MECHANICS, DEPT. R, 224 WEST 57TH STREET, NEW YORK, N.Y. 10019.

## BUSINESS OPPORTUNITIES

**IMPORT-Export Opportunity.** Profitable World-Wide Mail Order Business From Home, Without Capital or Travel Abroad. We Ship Plan for No Risk Examination. Experience Unnecessary. Free Report. Mellinger, Dept. A2708, Woodland Hills, California 91364.

**CUSTOM FRAMING—PICTURES, PORTRAITS—MAKES \$\$\$!** New easy-to-learn method . . . everything you need to know and do to start making money quickly in this pleasant, profitable, fast-growing field. Details **FREE. CREATIVE FRAMECRAFTERS**, 1205 W. Barkley, Dept. 4PM3, Box 16, Orange, Ca. 92666.

**PREPARE Tax Returns**—Policeman Albert Myers made \$2000 his very first season. Train at home. VA Approved. National Tax School, Monsey, 2HF, N.Y. 10952.

**SECRETS!** Mail Order Success. Internationally famous expert reveals how to make home business fortunes. Beginners: Get Free report "Make Money By Mail." Discloses free advertising, profitable products. Marico, Dept. AC708, Woodland Hills, California 91364.

**TAKE Catalog Orders.** We drop-ship 1001 best-selling specialty products. Lowest below-wholesale prices. Immediate delivery. Spectacular home business opportunity. Free Book. SMC, 8061 De Soto Ave., Dept. 20-32, Woodland Hills, Ca. 91365.

**MAKE \$7.50 to \$15.00 hourly** building portable custom cases in your home. Huge demand. Get orders by mail. We supply materials, instructions—everything. Free details. Custom Case, 6075 De Soto, Dept. 20-32, Woodland Hills, Ca. 91365.

**ABANDONED INDUSTRIAL SILVER**—Yours for taking! \$24,000 yearly possible. Free information: Silverman B-13, Box 548, Woodville, Texas 75979.

**MAILORDER**—Easy Beginners Instructions. \$1.00. JB, Box 225, Inver Grove Hts, Mn. 55075.

**PIANO Tuning** Learned Quickly at Home! Musical knowledge unnecessary. Free Information. Empire School, Box 450327, Miami, 33195.

**\$200.00 SPARE Time** earnings with your Tablesaw. Write: Workshop Five, 3800 Harney, Vancouver, Washington 98660.

**\$300-\$700 MONTHLY.** Raise Rabbits. Laboratory Animals for us. We supply Equipment, Breeders, Instructions. Details 25¢. MP11. Rabbits Of Michigan, Countyline Road, Pentwater, Michigan 49449.

**DEALERS Wanted!** No Product Investment. Details 25¢. Giftworld, Box 567PM, Pontiac, MS. 38863.

**MAILING List** Send \$3.00 and Receive all Needed information about Mail Businesses. Ramden, Box 3, Roxboro, Quebec, Canada B.

**SELL Books** by Mail. Complete Dealer Set-Up 25¢. Ullis Distributors, Box 34672AUT, Los Angeles, California 90034.

**FANTASTIC PROFITS!** Make 2 to 3 times your cost on hundreds of products. Gift items, novelties, toys, carded merchandise, 1001 others. \$2.00 brings giant catalog, refundable on first order. **PROFIT NOW!** Superior Merchandise Company, 925 Euclid Ave. NE, Dept. PM, Atlanta, Georgia 30307.

**\$12.50 HOUR** With Vacuum Cleaner Repair-Rebuilding Business! Proof—Baron, Box 863AB3, Portales, New Mexico 88130.

**\$100.00 DAILY.** \$1.00 brings detail package airmailed. Bousfield 30B8, Box 1511, Redding, Calif. 96001.

**VENDING Machines.** No selling. Routes earn amazing profits. Big catalogue Free. Parkway Machine Corporation, 1930PMB Greenspring Drive, Timonium, Maryland 21093.

**"SELL Books** By Mail. Complete Dealer Setup 25¢. Packerland Publishing, Box 3193JB, Green Bay, Wis. 54303.

**YOUR OWN Successful mailorder business!** Learn how before investing. Free Details. Northeast Associates, Box 191-MH, Coventry, Connecticut 06238.

**\$1.00 LISTS** You year sent to 1000 Importers, Jobbers, Mailers, your mailing year. DixieMI, King, North Carolina 27021.

**\$100.00 DAY.** Manufacturing Concrete Blocks, Posts, Semi-Automatic Block Machines. Mold Equipment Catalog, over sixty items, \$3.00 refundable. Carlayne, Route One, Box 95, Rapid City, South Dakota 57701.

**SELL Books** by mail. Complete dealer set-up—25¢. Midwest Mail Sales, Box 44R2-PM, Shawano, Wisconsin 54166.

**PIANO Tuning** Quickly learned with home study course. Diploma granted. American Tuning School, 17050 Teller Dr., Morgan Hill, Calif. 95037.

**\$200.00 DAILY** In Your Mailbox! Opportunity To Follow Mailorder Experts. Free Details. Associates, Box 136-A, Holland, Mich. 49423.

**BECOME "Mortgage Broker."** Lucrative! Capital Sources. Box 640099, Uleta, Florida 33164.

**FREE COLLECTION AGENCY** Details!! \$1000.00 Monthly Possible. Master-PM, Dawsonville, Georgia 30534.

**HOW TO RAISE \$100.00 to \$1,000,000.00!** Write: Capital-PM, Dawsonville, Georgia 30534.

**I MADE \$40,000.00 Year** by Mailorder! Helped others make money! Free Proof! Torrey, Box 318YY, Ypsilanti, Michigan 48197.

**MAIL Baby Catalogs** to New Mothers for Big Profits! Details 25¢. Volz-PM, Ypsilanti, Michigan 48197.

**NEW, Compact fire extinguisher.** Fantastic profits. Exclusive territories. Norwich Chemical, Norwich, Connecticut 06397.

**RECEIVE Mail** Galea! National Listing. \$1.00. Sufkins, 1313-M, Brunswick, GA 31520.

**WATCH REPAIR.** Learn this cash business at home. \$5 monthly. Free details. Chicago School of Watchmaking, YVA, Fox River Grove, Illinois 60021.

**\$200 WEEKLY!** Make. Sell Bricks! Free information! Xcto Bricks, 5715 N. Mozart, Chicago, Ill. 60659.

**HOW TO OPERATE** a Profitable Bookkeeping Service For Small Businesses. R.I. Systems., Co. 1645-A Warwick Avenue, Warwick, R.I. 02889.

**START Your Own Correspondence School** • Pioneer Schools, 209 S. Citrus, Suite 7, Covina, Ca. 91723.

**FREE WEALTH BOOK:** "2100 Unique Ways To Make Money!" Worlds Biggest Collection of Home Businesses!! Success-M, 26903 West Eight Mile, Detroit, Michigan 48240.

**EARN \$80.00 Daily** Manufacturing Concrete Bricks-Tiles-Wooden Molds. Send Stamp, Kilmar, Route One, Box 347-DH, Vairico, Florida 33594.

**\$15,000 + ANNUALLY. IMPORT MAILORDER OPPORTUNITY.** One year risk free trial basis. Details: Northeast Imports, Box 121M8, Fremont, NH 03044.

**\$100,000 YEARLY** Mailing Information! Free Proof! Albers, Box 17052, Minneapolis, Minnesota. 55417.

**WORLD'S Largest Supply.** 25% to 40% under wholesale. Closeouts. **HONG KONG** Clothes. Automobiles. Electronics. Free Details. International Buyers, Box 16386MM, Portland, Oregon. 97233.

**REPAIR Hydraulic Jacks**—Details Free. Write! Hydraulic Parts Supply, Box 4157, Brownsville, Texas 78520.

**YOUR Own Mailorder Catalog Business.** No Merchandise Investment, Details Free. A.M. Sales, 31-14 94 St., East Elmhurst, NY 11369.

**STUFF Envelopes.** Earn \$500 per thousand. Free Supplies. Send stamped addressed envelope. Gozdanovic, 160 Banner Way, Pittsburgh, Pa. 15201.

**NEW Mailorder publication.** Tells everything! Details free: Adams, Room 608, 12128 W. 70th., Arvada, Colorado 80004.

**\$50,000.00 YEARLY!! EASILY** By Mail! Instructions With Proof! Dollar Bill, Carter Company, 22 Laplace Acres, Searcy, Ark. 72143.

**"\$500/THOUSAND POSSIBLE STUFFING ENVELOPES, INFORMATION/SUPPLIES, STAMPED, ADDRESSED, ENVELOPE, Agent-58, Box 159, Clayton, Indiana 46118."**

**FREE MAILORDER Report!** Plan Guarantees Beginners \$50.00 per order - to \$750 Weekly! Professionals, Box 21093-E, Seattle, WA. 98111.

**MAILORDER Professional Books** Learn Facts, Secrets Free Details. PERRY'S, Box 17194, West Hartford, Conn. 06117.

**\$60 DAILY.** Manufacturing New Building Block (Easily!) Complete Instructions \$2.00. Guaranteed. "Miracle Brick-B", 42308 284th SE, Enumclaw, Washington 98022.

**UNLIMITED Profits!** Best Mailorder Opportunities! Free Details! JM17, 555 Roscoe, Chicago 60657.

**EARN \$60.00 Daily** manufacturing Concrete Fence Posts. Practically no investment. Send stamped addressed envelope. American, Excelsior Springs, Mo. 64024.

**MAILORDER—ESSENTIAL** Library of Instructional Books for Everyone Entering This Fantastic Field. \$1.00 for Introductory Book. G&D Sales, Box 144A, Belvidere, Illinois 61008.

**\$100.00 WEEKLY** Guaranteed addressing envelopes. Setup \$2.00. Bumphus, Box 9306-P, Washington, D.C. 20005.

**MAILORDER MAKES \$50,000.00 year!** START home business in spare time. Make extra money. Literature free. Lyu, 1003 Wellington, Greenville, Michigan 48838.

**1000% PROFIT** Bronzing Baby Shoes At Home, **FREE LITERATURE.** NBCPM, Box 570472, Miami, Florida 33157.

(Continued on next page)



## BUSINESS OPPORTUNITIES

(Continued from preceding page)

**\$178.00 WEEKLY.** Work one hour daily. Guaranteed, FAS, Box 13703-J, San Antonio, Texas, 78213.

**MAILORDER Millionaire** helps beginners make \$500 weekly. Free report reveals secret plan! Executive (188A), 333 North Michigan, Chicago 60601.

**EASY, PROFITABLE.** Your own envelope stuffing business. Start immediately. Two complete home-worker plans, \$5.00. Guaranteed. BMC, P.O. Box 68, Logan, Utah 84321.

**FREE Moneybook!** "Millionaires Success Secrets." Amazing profit opportunities. B&M Distributors 234, Box 1116, San Francisco, 94101.

**\$70 TO \$200 WEEKLY—Home, Spare Time Simplified Mail Bookkeeping.** Immediate income. Easy. Auditax, Box 34741A, Los Angeles, Calif. 90034.

**\$250.00/THOUSAND IMMEDIATELY.** Stuff envelopes. RUSH addressed-stamped envelope. Michaels, Box 16043B, St. Paul, MN 55116

**VINYL'S** Where The Money Is! Invisibly repair, re-finish, recolor furniture, luggage, car tops. Quick, easy. Two small \$20 jobs a day earn you \$1,000 a month. Homes, cars, offices, restaurants, unlimited customers. Start earning after an hour's practice. Sensational details Free. VIP, 2007 Montrose, Chicago, 60618.

**\$198.00 WEEKLY.** Spare Time. Completely Guaranteed. Details: Key Distributors, Box 5175, Willowick, Ohio 44094

**OVER \$16.50 an hour.** Spare time at home! Rubber Stamp Industry needs mail manufacturers. We furnish all equipment and know-how! Particulars free! Write: Roberts, Room RC-2-EK, 1512 Jarvis, Chicago, IL 60626

**OWN A BUSINESS?** Planning one? We Help. ANY question answered or your money back. No books to buy or waste through. **QUICK, EASY,** planning forms. Make your business **GROW, IMPRESS** your banker. Only you can make it happen. **NOW!** \$1.00 per question, \$1.00 for samples. Dreams Unlimited, Box 6671, Santa Rosa, CA, 95401.

**STUFF ENVELOPES \$250/Thousand.** Send Stamped, Self-Addressed Envelope, Ashner, Department 3, 4500 West 87th Pl., Prairie Village, Kansas 66207.

**\$450.00 WEEK.** Proven, Mailorder Winner, Fabulous Results. Details \$1.00. Donald Card, Box 522, Carrollton, Mich. 48724.

**PORTABLE Sandblaster \$29.95.** Distributor wanted. Free Brochure. Inka, Box 66573-A, Houston, Texas 77066.

**EARN** Money raising fishworms for us! Write: Oakhaven-38, Cedar Hill, Texas 75104.

**FREE 100-Page Catalog** waiting to bring you Big spare-time cash commissions. Sell Advertising Book Matches. Every business a prospect... complete selling instructions furnished. Steady, repeat business. Dept. MX875, Superior Match Company, 7530 South Greenwood Avenue, Chicago, Illinois 60619.

**\$100 DAILY.** 100% Interest, honestly, \$3.00. Valuable information, 10¢. Homcraft, 2350 W47AF, Denver, CO 80211.

**MILLIONAIRES SUCCESS SECRETS!** Exciting free details! Success, Box 40A, Layton, Utah 84041.

**\$400.00 MONTHLY** Raising giant fishworms. Soilless method. Charlie Morgan, Bushnell, Florida 33513.

**\$250/THOUSAND STUFFING ENVELOPES. FREE SUPPLIES** Send Stamped Addressed Envelope, Glenco Malters, Box 495-E, Glenwood Springs, Colorado 81601.

**FREE Brochure—"Mailorder Jewelry Business".** Jemco, 621 Tucson, Lexington, Ky. 40503.

**MAILBOX EMPTY?** Fill It With Money. Learn Secret. Free details. Stephen, Box 1150, West Chicago, Illinois 60185.

**MAILORDER SUCCESS!** Save Money, Time, Start Now! Free Details. Master PM, Box 3944, Charlotte, N.C. 28203.

**500 MANUFACTURERS** Names **WORLDWIDE.** Free Book explains Profit Importing. Send \$1.00. J. Enterprises, 208 Somerset, Thousand Oaks, Ca. 91360.

**MAILORDER'S BEST BEGINNERS LIBRARY** Ever Published. Expert Reveals Secrets of 40 Years Success. Write: Barclay, Box 45PH, Mahan, N.Y. 11743.

**\$500.00/THOUSAND—Stuffing Envelopes.** Begin immediately. Beginner's kit, \$1.00. Guaranteed! Contemporary, Box 1144H, Forest Park, Ga 30050.

**INCREASE** income through knowledge! Mail order entrepreneurs! "Library of Wealth-Building Information." \$1.00 postage/handling. T.R. Enterprises, Dept. 5701, 4115 Kirkham, San Francisco, CA 94122.

**UP TO \$2,000.00 MONTHLY** Fabulous New Business Rush 25¢ for Brochure. Staro Co., 33-B Kelley St., Taunton, Ma, 02780.

**FANTASTIC PROFITS.** Successful mailorder business. Write: Professional Secrets, Box 5516, Walnut Creek, CA 94596.

**\$250/THOUSAND.** Stuffing Envelopes, free supplies, send stamped addressed envelope; Phillips, Box 332-A8, Idaho Falls, Idaho 83401.

**HIGH PROFIT BUSINESS** Sensational Idea \$2.00 Booklet explains. Paul Uber, 4015 Brookside Lane, LaGrange, Wis. 54601.

**\$1000.00 WEEKLY** In Your Mailbox! Mailorder Executives Reveal Proven Secrets! Free Details! Executive, Box 6273-B, Anaheim, California 92806.

**\$250/THOUSAND STUFFING ENVELOPES, FREE SUPPLIES,** Rush Stamped Addressed Envelope, Beach, Box 3505, Lancaster, California 93534.

**MONEY:** From Bicycle Repair. Acute Shortage of Trained Personnel in this Rapidly Expanding Field. No Capital Outlay. Use Household Tools. Send \$8.00 to: Frank Collins, Box 35, West Hill, Ontario, Canada. (M1E 4R4) For Book. Gives all instructions to Put You In Business as Competent Repair Person. One Small Repair Pays For Book.

**MAKE 2 To 3 Times** Your Cost on Tools, Toys, Household Items, Jewelry, others. \$2.00 Brings Giant Catalog. Quality Wholesale G-3, 3116 Meek Road, Goshen, Ohio 45122.

**GLASS Cutting** and Stain Glass Window Making. Tiffany Lamp Shades, Jeweled-Like Picture Frames Easy to do. Profit Fast—Send \$2.00 for all information needed for a good start. The rest is put to you! Buzholm, Box 3567, Flint, Mich. 48503.

**MAILORDER DEALERS.** Merchandise Dropshipped. Free Catalog, Details. Dunes, 310 IH Southeast Parkway, Richmond, Indiana 47374.

**AMAZING Mailorder Profits** using tested, proven methods. Free Details, Write: J & M Enterprises, Box 1364-D, Jackson, Miss. 39205.

**MAKE \$92.00** From Square Foot Plywood (Jigsaw or Bandsaw necessary). (Proof), details 25¢. (Refundable). Woodart, Bridgewater, Mass. 02324.

**CALIFORNIA MANUFACTURER NEEDS MAN** to assemble our product and be local agent; experience unnecessary. May start while presently employed. Five-figure income for responsible applicant. S.K.R.M. Manufacturers, 911 N. Lagoon Ave., Wilmington, Ca. 90744.

**START YOUR OWN EMPLOYMENT AGENCY.** Enjoy personal satisfaction, prestige, profit. We provide necessary training. Personnel Resources, Inc., P.O. Box 15407, Seattle, Wa. 98115.

**FREE—Strike It Rich Report** "How To Operate Your Own Profitable Sales-By-Mail Business." Franklin Advertising, Inc. (Since 1948) 216FY-Pico, Santa Monica, Calif. 90405.

**LAZY?** Produce oil portraits in seconds! Details 25¢. JiffyPortrait, 2830PV, Gailey, San Pedro, Calif. 90731.

**\$250—500 THOUSAND, STUFFING ENVELOPES,** Complete Assistance, Send Stamped Addressed Envelope, Marco, Box 13159, Pittsburgh, Pa. 15243.

**100,000 JUNKMEN CAN'T BE WRONG!** How to make astounding profits in your own spare-time second-hand business. Buy and sell high-quality name-brand tools, furniture, hardware, appliances. Sample Newsletter—50¢. Drexler-P4, Box 26419, Phoenix, AZ 85068.

**\$250-\$500/THOUSAND STUFFING ENVELOPES, COMPLETE ASSISTANCE.** Send Stamped Addressed Envelope, Henniksen, Box 6080 PM8, Minneapolis, Minnesota 55406.

**START A Small Export/Import Agency.** Capital Unnecessary. Full Instructions. Transtrade Ltd., (Dept. P11), Box 2349, Boston, Mass. 02107.

**COLLECT Names . . . Earn \$300 Per Thousand . . .** 50 Free Dealerships . . . 25¢ And Stamped Self-addressed Envelope. Quality Products, Box 2118, Monroe, Wisc. 53566.

**GET RICH BY MAIL!** Free Details! JM Enterprises, 2365-A Union, San Francisco, Ca. 94123.

**FURNITURE Stripping Business** Available without a franchise. Send just \$5.00 for complete operations manuals, that will show you everything you must know to start and operate your own business. I.F.S., P.O. Box 8742, Canton, Ohio 44711.

**ESTABLISH Successful Home Mailorder Business!** Mears, C5363 Essex, Alexandria, Virginia 22311.

**SUCCESSFUL Mailorder Business Available!!** Everything tested, proven; ready to make you big profits. Free details. Arman Company, 8PM-Jade, Huntington, Indiana 46750.

**FREE SECRET BOOK** "2042 Unique Proven Enterprises." Tiny businesses but huge profits! How Little Fellows beat inflation. Work home! Haylings, Carlsbad, California 92008.

**OPERATE Fascinating Newspaper Clipping Bureau.** Profitable Instructions, 25¢. Schroeder, Box 134, Mossville, Illinois 61552.

**COLLECT Names** earn \$300 per thousand possible. Also 50 free dealerships available. Send 25¢ and stamped self addressed envelope. E. C. Trazzare, 71 Columbia St., Patchogue, New York 11772.

**HOLLYWOOD Cementcraft:** Profitable Home Business. Experience Unnecessary. Unlimited Pottery Designs Made Without Moulds. Birdbaths, Fountains, Wishing-Well, Waterfalls, etc. Chemical Coloring Formulas, Marble-Glazing. Free Brochure. Concrete Facts, 602 Athens Street, Altadena, Ca 91001.

**EASY Cash** At Home Seven Ways. Details 50¢. Welch World Imports, Dept. 701C, 6455 Fenton, Arvada, Colo. 80003.

**\$500 MONTHLY!** Stuffing Envelopes and clipping newspapers: Free Supplies. Rush Stamped Addressed Envelope. J. M. Winter, 18 Carey St., Mahopac, N.Y. 10541.

**EARN Extra Money.** Eleven Exciting Opportunities. No Experience Necessary. Details 25¢. Koch, 23-C Grange Avenue, Welland, Ontario, L3B 1G6.

**FASTEST Sellers-Profits,** \$9.00 on every \$10.00. Free details. Goodie's Enterprises, Dept. 875PM, Box 193, San Mateo, Florida 32088.

**HOW** to start a publishing house in your spare room. Publish books, courses, newsletters inexpensively. Amazing profits. Information free. Specialty-6C10, Box 653, Newberry, South Carolina 29108.

**IMPORT-Export Opportunity.** Your own Profitable Mailorder Business Operated from Home. Income unlimited. Free Trial. Westwind Imports, 6060 Gulfport HSPM, Houston, Texas 77036.

**\$50.00 PER Hour Part Time.** Free Details, Bob's, 7461 Alpine Way, Tujunga, Calif. 91042.

**GOLD MINE JUNK CARS!** Easy to convert almost any truck into one man auto salvage hauler wrecker. Free details. Auto Salvaging, 27 Middlesex, Darien, Conn. 06820.

**PROFITS FROM CLASSIFIED ADVERTISING!** Booklet shows you how to start your own business with Classified Advertising. Only \$1.00 (Refundable with first order.) H. E. KAPPEL, POPULAR MECHANICS, DEPT. P, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.

## MONEYMAKING OPPORTUNITIES

**SPARE TIME CASH.** Sell famous Hanover Shoes. Samples, sales kit free. No experience needed. No age limit. Big commissions. Hanover Shoe, Dept. 1415, Hanover, Pa. 17331.

**\$500 MONTHLY Possible—Clipping newspaper items** for publications. Details—Rush stamped envelope. Income, Box 721-B, Lynbrook, N.Y. 11518.

**365 FAST, easy ways to make money!** Free! Rush name, address, zip. Perry, 13263PM Ventura Blvd. Studio City, Calif. 91604.

**MONEY MAKING:** Booklets showing how, where sell. Complete information. Writing short articles, 75¢. Selling camera photographs, 75¢. Both \$1.25—(unsatisfied moneyback). Carragher Sales Company, North 64, Maple Park, Illinois 60151.

**\$50 DAILY Possible.** Finding Ginseng, Book Tells How! \$3.95: J&L, 5801 West Encanto, Phoenix, Arizona 85035.

**ACHIEVE MAIL-ORDER SUPREMACY. DETAILS** 25¢. Wayne, Box 230PM, Koltville, N.Y. 11742.

**DOUBLE Your Income!** Ask How! Write: FAR-5, 148-25 89th Avenue, Jamaica, New York 11435.

**\$\$\$\$\$ EXTRA!** List of Books on Self Improvement. Send 50¢ (refundable) to: J. P. Hall, 7305 Bay Street, Dept.-A, St. Petersburg Beach, Fla. 33706.

**NEED EXTRA INCOME?** Sell famous Knapp Cushion Comfort Shoes. Part-time, full-time. Over \$8 million in commissions last year. No investment. Free selling kit. Write I. Margolis, 612 Knapp Centre, Brockton, Mass. 02401.

**"BUILD CLOCKS FOR ART SHOWS. BIG PROFITS.** Clock Movements From \$4.95. Quantity Discounts. Kits, Dials, Frames, Craft Hardware, 40 Page Catalog 50¢. Newport, Box 6848A, Burbank, Calif. 91510."

**37 WAYS To Make Money** when you're out of work—Details Free—R&R Investment Co., Dept.-2A, 729 Treat Blvd., Tallmadge, Ohio 44728.

**STUFF Envelopes \$500/thousand. FREE Supplies.** Rush Stamped Addressed Envelope. Capital Enterprises, 2 Orion Ct., Baltimore, Md. 21237.

**\$500 PROFIT FROM \$30 SALE.** Million Dollar Success Plan. Confidential guide and samples for \$1.00. Bolger, Box 5591, San Diego, Calif. 92105.

**ATTENTION:** Wanted, persons interested in being contestants on various television game shows. For instructions send \$2.00. "DHS" P.O. Box 519, ANSONIA STATION, NEW YORK, NEW YORK 10023.

**FREE OFFER!** Make Big Money Selling Beautiful Jewelry. Send for FREE catalog and FREE starting outfit. Heritage—23, 103 Goodhue Building, Beaumont, TX 77701.

**VENDING Machines.** No selling. Routes earn amazing profits. Big catalogue free. Parkway Machine Corporation, 1930PMM Greenspring Drive, Timonium, Maryland 21093.

**HOW To Make Money** writing short paragraphs. Information free. Barrett, Dept. C-27-D, 6216 N. Clark, Chicago, 60660.

**WORLD'S Leading Contest Magazine,** 50¢. Prize-winner, 1315 Central, St. Petersburg, Fla. 33705.

**CLIP Newspaper items,** \$1.00-\$5.00 each. Details free. Walter, Box 1360-PA, Erie, Pa. 16512.

**LEARN, EARN** Mail Order from Home Spare Time. Been telling how since 1929. Facts, Stories, Sources, Thousand Offers, Complete Course in Mail Order. Sample Copy 50¢; Year \$12. Mail Trade Magazine, Box 1302, Springfield, IL 62705.

**MAKE Statuettes, novelties, imitation marble.** Sell to stores or start gift shop. Free details. Marbleizing, 41 Waverton, St. Louis, Mo. 63124.

**\$175.00 WEEKLY** Correcting Pupils' Lessons! Samples, \$1.00! Castle's, 507-LP Fifth, NYC 10017.

**LEARN** the secrets of repairing junk batteries. "Fabulous Profits" at home. Apex Engineering, 3100 Ramona, Atascadero, California 93422.

**FREE! LATEST DIRECTORY OF 500 CORPORATIONS SEEKING NEW PRODUCTS!** If you have an idea for a new product—or a way to make an old product better, send for our FREE INVENTORS KIT NO. A-85. It gives vital information on developing and marketing your invention/idea for Cash/Royalty Sales to corporations nationwide. Raymond Lee Organization, 230 Park Avenue, New York, N.Y. 10017.

(Continued on next page)



## MONEYMAKING OPPORTUNITIES

(Continued from preceding page)

**GET** World's Biggest Wholesale Import Catalog. Write: World, Medina, Washington 98039.

**\$50 PER** Evening Addressing Envelopes. Homework Guaranteed. Free Details. Sterim, Box 23E, Sterling Heights, Mich. 48078.

**FREE WEALTH BOOK:** "2100 Unique Ways To Make Money!" World's Biggest Collection of Home Businesses!! Success-M, 26903 West Eight Mile, Detroit, Michigan 48240.

**FREE** Details! Win lifetime income from Dice, Roulette, Thoroughbred, Harness, Dog Racing. Guaranteed! Research, Box 551PM8, Mineola, N.Y. 11501.

**\$1,000 MONTHLY!** Stuffing Envelopes and Clipping Newspapers: Send Stamped Addressed Envelope . . . IOY, Box 936-C, Hyattsville, Maryland 20783.

**WOODWORKERS**—Earn \$10.00 per Hour Constructing Projects for Craft and Consignment Shops. Guaranteed Instructions describe Projects and Selling Methods. \$3.00. Woodcraft Ideas, Box 193, New Middletown, Ohio 44442.

**\$200.00 PROFIT.** Sheet 1/4" plywood. Details 50¢. Novelties, 610 So. 24th, Elwood, Indiana 46036.

**\$500/THOUSAND POSSIBLE STUFFING ENVELOPES, INFORMATION/SUPPLIES, STAMPED, ADDRESSED, ENVELOPE.** Aaron-58, Box 466, Monrovia, Indiana 46157.

**\$8,000 MONTHLY SPARE TIME!** No Selling! Start Now!—Free Proof!!—Owco, Box 665, Inglewood, Ca. 90307.

**STOP WISHING!** This is it. Servicemen, vets, anyone. Make money at home, camp, anywhere. Nothing like it. Stamp, 25¢ brings loads particulars, info. Bill Smith, P.O. Box 1878, Cincinnati, Ohio 45201.

**ADDRESSERS** Mailers Needed. Earn to \$150.00 weekly. Details 25¢ plus stamped addressed envelope. Daniel Wanser, P.O. Box 27, Bellmore, N.Y. 11710.

**BECOME** Professional Driving Instructor. Own Business. \$400.00 weekly. Howard David, 1818 Everts, Phila., PA. 19152.

**\$100.00 WEEKLY** Clipping Newspaper Articles! Details 25¢ and Stamped Envelope. Sunny, Box 579E, Plaistow, New Hampshire 03865.

**\$39.60 DAILY.** Immediate Proven Income. Easy Homework. No Mailorder Gimmick! Free Details Self-addressed Stamped Envelope: \$Biamc, Box 4160, Los Angeles, Ca. 90028.

**\$500 WEEKLY**—Guaranteed Easy, Immediate Spare-time Earnings At Home—Free Proof—Research, Box 90133PM, Atlanta, Georgia 30344.

**UNIQUE** Money-making Homework. \$1.00 and stamped, self-addressed, #10 envelope for information. Kelly Ross, 3148 East Vanburen, Suite 129, Phoenix, Arizona 85008.

**MAKE** Money! Your Old Phonograph Records may be Valuable. Booklet and Information Reveals How—\$2.00. Songs and Records, Box 863PM, Burbank, Ca. 91503.

**GET RICH** With secret law that smashes debts and brings you \$500 to \$2 million cash. Free Report! Credit (648), 333 North Michigan, Chicago 60601.

**\$40 DAILY** Possible tying fishing flies at home. Details 50¢. Flyco, Box 946-P, Albany, Oregon 97321.

**FREE**—Easy Ways to make money selling exciting new products—Full—spare time. Send name, age for 5 months free subscriptions. Salesman's Opportunity Magazine, 1460 Hancock Center, Dept. 464, Chicago 60611.

**VINYL'S** Where The Money Is! Invisibly repair, re-finish, recolor furniture, luggage, car tops. Quick, easy. Two small \$20 jobs a day earn you \$1,000 a month. Homes, cars, offices, restaurants, unlimited customers. Start earning after an hour's practice. Sensational details Free. VIP, 2062 Montrose, Chicago, 60618.

**COLLECT STAMPS** For Profit! How to start. Where to sell. Complete guide. \$1.50. Country News Shop, Rts. 37 & 39, Dept. F, New Fairfield, Conn. 06810.

**GET Rich!** . . . Using Borrowed Money!! Free Information: Aware, Box 1248PM7, Pacifica, Ca. 94044.

**WILL** You actually (really & truly) address, stuff and mail 20 envelopes a day? Then don't let's mess around. Send \$5 and we'll show you how to make up to \$1,000 monthly and even much more. **GUARANTEED!** Contractual Arrangements. Habersham-Hall, Box 613-F, San Pedro, Ca. 90733.

**"HOW To Make Money Writing Fillers"**. Get The Facts! Informative Booklet \$1.50. Cleman Dalwin Sales, 3227 Albert, Dept. PM8, Royal Oak, Michigan 48072.

**MAKE** Big Money! From Home, Spare Time. 25¢. Addressed stamped envelope. Bogar, 370 Wagner Ave., Perth Amboy, N.J. 08861.

**MAKE EXTRA MONEY.** New Booklet shows you How to Make Money in your Spare Time. \$1.00: Galante Enterprises, 461 Alter Ave., Dept. C85, Staten Island, NY 10305.

**TURN** Your HOBBY into MONEY! AMAZING booklet just \$2.00! Leitler, Box 96-A, Glenview, Ill. 60025.

**EARN** \$60 Daily Practical Work Making Concrete Fence Posts at Home. Part Time/Full Time. Free information. McLendon, Box 1255, Cedartown, Georgia 30125.

**4,000,000 NEWBORN** Babies Yearly. Proud Parents. YOUR, Mailorder Market. Details—Sample .25¢. Sendagan, Box 5037, Jersey City, New Jersey 07305.

**RECEIVE** Up To \$100 and More Daily in Your Mailbox. Amazing Plan plus other moneymaking Formulas, \$1.00. Master Plans Ltd., RR Box 310, Dept. PM, Barryton, Mich. 49305.

**WOODWORKERS** 300% profit making 3-M reflective house numbers. Details \$1.00 Refundable. Powers, 2708 Georgia, Vallejo, Ca. 94590.

**"YOUR KNOWLEDGE** can bring you millions. Exact steps. \$5.00. Roseman, 166 Palm, San Francisco 94113".

**ADVANCE MONEY** Mailing Circulars! Beginners Kit \$1.00. Details: Send 25¢, Stamped, Addressed Envelope. Security, 3417 Dartmouth, Irving, Texas 75062.

**SCIENTIFIC** Massage: Big Earnings; uncrowded profession. Learn spare time at home. Diploma awarded. Free Catalog. Write: Anderson School, Dept. J-1C, Princeton, Illinois 61356.

**MAILORDER RICHES CAN BE YOURS!** Free Details! JM Enterprises, 2365B Union, San Francisco, Ca. 94123.

**\$60.00-\$100.00 WEEKLY, HOMEWORKERS.** Send Stamp For Details, H&K, Box 8351-A8, St. Louis, Missouri 63132.

**HOMEWORKERS!** Receive \$100 weekly income, mailing six envelopes daily. Setup \$2.00. GEMX, B21244A, Indianapolis 46221.

**ACT** Now. Big Money Writing Short Articles at home. Report Tells How! Where! Send \$2.00. Laffaire Enterprise, 31 Christen Ct., Lancaster, New York 14086.

**\$25,000.00 MINIMUM** yearly possible!! Mailorder most dynamic program. Write, Delemer, Jerusalem-I-9, Fajardo, P.R. 00648.

**FREE SECRET BOOK** "2042 Unique, Proven Enterprises." Largest successful collection! Fabulous "Little Knowns." Work home! Haylings, Carlsbad, Calif. 92008.

**MAKE** 2 to 3 times your cost on hundreds of products. Gift items, novelties, toys, carded merchandise. 1001 others. **DETAILS FREE!** The Bourbon Barrel, Box 7239, Hollywood, Florida 33021.

**STUFF** Envelopes \$500/Thousand Immediately. Free Supplies. Rush Stamped, Addressed Envelope. RS-Industries, 1901 Hailford Ave., #69, Santa Clara, Calif. 95051.

**\$1000 MONTH** Mailing Letters. Guaranteed. Plan, \$4.95. Sell Ordinary Sand \$5 pound. Plan, \$4.95. Details, 25¢. Sandco-PM, Ceres, California 95307.

**\*\*\*Using OUR SECRET METHOD,** Some Average Working People Are Buying Houses For No (\$0.00) Money Down Payment—Then Selling The Houses 2 To 8 Weeks Later For A \$5,000 TO \$10,000 PROFIT Per House. To Learn This Amazing Method Send \$3.00 To: Money Methods, Suite 240, Dept. 1A, 410 Pierce, Houston, Tx. 77002.

**STUFF** Envelopes. \$250/Thousand! Guaranteed. Send stamped addressed envelope. NRG, Owego, New York 13827.

**MAILORDER! \$2,000 MONTHLY POSSIBLE! WORK HOME . . . EVENINGS ONLY!** Free Proof. Associates, Route 3-PA, New Sharon, Iowa 50207.

**\$250-\$500/THOUSAND, STUFFING ENVELOPES COMPLETE ASSISTANCE.** Rush Stamped Addressed Envelope, Strauss, Box 516, Smithville, Ohio 44677.

**EARN** Big money as Manufacturers' Representative—Details. Keith Kiltrell, 808 Broadway, Kansas City, Missouri 64105.

**MONEY!** Beyond your wildest dreams. Operate unique business from home. No special skills. Not mail order. Complete **FANTASTIC** plan \$19.95. Details 50¢. Guaranteed. Hurry! J. C. Rivera, Box 8215, Rowland Hgts. Ca. 91745.

**ADDRESSING/MAILING** Merchandise circulars. **\$8.00 PROFIT** on every \$12.00 order. Everything furnished! LVD, Rt3-PM8, New Sharon, Iowa 50207.

**PROFITS FROM CLASSIFIED ADVERTISING!** Booklet shows you how to start your own business with Classified Advertising. Only \$1.00 (Refundable with first order.) N. E. KAPPEL, POPULAR MECHANICS, DEPT. P, 224 WEST 57TH STREET, NEW YORK, N. Y. 10019.

**PROFITABLE OCCUPATIONS**

**ADVERTISING** Business—You own it! \$400 first week or money back. Write: Action Ad Clock, Room AC-2-EK, 1512 Jarvis, Chicago, Ill. 60626.

**FREE** Catalogs. Repair air conditioning refrigeration. Tools, supplies, full instructions. Doolin, 2016 Canton, Dallas, Texas 75201.

**FT. SMITH** Auction School, Ft. Smith, Ark. 72901. Resident & Home study. Veteran approved.

**\$100.00/DAY POSSIBLE!!!!** Buy Scrap Gold . . . Easy . . . Complete manual, \$4.00 Satisfaction Guaranteed . . . Brown, 956 Springdale, Atlanta, Ga. 30306.

**PLASTERCRAFT!!!** Profitable home business. Molds available. Details: Lynnette, 6251C Mentor Park, Mentor, Ohio 44060.

**YOUR OWN** Security Guard Agency. Complete Manual, \$5.00. Marsec, Box 621, Santa Fe, N.M. 87501.

**MAKE MONEY** IN SPARE TIME. Earn generous commissions as a subscription sales representative for leading magazines. For full details and instructions, send this ad with your name and address to: **POPULAR MECHANICS**, Room 1107M, 250 W. 55th St., New York, N.Y. 10019.

**HAVE YOUR OWN MONEY BUSINESS.** No Experience or Capital Required. Free details, write: Thomas, P.O. Box 68, Morton, Pa. 19070.

## SALESMEN---DISTRIBUTORS

**BIGGEST** Earnings ever! Famous Hertel fully referenced Bible! Proved plan. Starting 3-dimension cover. Easy credit plan. No investment. Demonstrator furnished. Write International Book, Dept. PM, Box 118, Wichita, Kansas 67201.

**FREE** Sample. Full Size fabulous Victory Miracle Cloth. Hnt \$1.00 seller; pays 80¢ profit. Starting demonstrator. Every surface sparkles like magic. Sample, details: Barry, Dept. A4188, 1312 Washington, St. Louis, Missouri 63103.

**LOOKING FOR EXTRA INCOME?** Show our new 1976 Line of Calendars. Promotional Advertising and Gifts to local Business Firms. Full or part time. No investment, collections or District Managers. Many promotions to help you get started. Prompt, friendly service with 66 year old firm, rated AAA-1. Weekly commissions and liberal Bonus. Write John McNeer, Dept. PM8, Newton Mfg. Co., Newton, Iowa 50208.

**AUTOMATIC** Fishhooks, Profitable Samples, \$2.00 (refundable). Aron, 61-PM, Mastic Beach, New York 11951.

**RUBBER** Stamps to 50% discount. Same day shipment. Free catalog. Star Stamp, Department M6, 732 Federal, Chicago, Illinois 60605.

**SELL** 25,000 Mile Synthetic Oil. Details \$1.00. Oil, 4271 N. Shore Drive, Eau Claire, Wis. 54701.

**MAGNETIC SIGN SALESMAN WANTED.** Free information. Box 76-U, Villas, New Jersey 08251.

**BIBLES WHOLESALE**—Free Circulars. Details. Write Bible Publishers, Box P5065, San Antonio, Texas 78201.

## AGENTS WANTED

**SPARE TIME CASH.** Sell famous Hanover Shoes. Samples, sales kit free. No experience needed. No age limit. Big commissions. Hanover Shoe, Dept. 1417, Hanover, Pa. 17331.

**EVERY** Man a prospect. Refundable sales kit offer showing line belt buckles, tie clasps, money clips, cuff links, lapels, identification badges, individualized with customer's name and emblems. Cap badges for trucking, bus, taxi, police, firemen. Also postal, letter carriers and heavy construction emblems. Choice 5000 emblems. Hook-Fast, Box 1088-PM, Providence, R.I. 02901.

**YOUR** Own business. Used Suits \$1.50; Overcoats 65¢; Mackinaws 35¢; Shoes 12½¢; Ladies' Coats 30¢; Dresses 15¢. Enormous profits. Catalog Free. Nathan Portnoy Associates, 2109-AA Roosevelt Road, Chicago, Illinois 60608.

**FABULOUS** New Beauty Mask. Earn Fantastic Profits Part Time. Also Party Plan—Grew Manager Opportunities. Barnes, Box 759-M, Portsmouth, Va. 23705.

**NO** Investment! Instant income! Selling outfit free! Take orders for America's finest shoes from friends, neighbors. Easy. Profitable. No experience necessary. Mason Shoes, K-157, Chippewa Falls, WI 54729.

**HOTTEST** Item EVER. Newest Money Maker—90% Profit Every Order—**FREE DETAILS**—Send Name And Address To: The Directory Service Co., P.O. Box 516-E, Morehead City, N.C. 28557.

## EMPLOYMENT INFORMATION

**NEW** Information about U.S. Jobs! "How To Find a Job During a Recession." Send \$2.00 guaranteed. Wayne & Co., Box 37350-A, Jacksonville, Florida 32205.

**RADIO!** . . . How to break into it. **GUARANTEED!** \$2.00. DJ, Box 32322-A, Detroit, Mich. 48232.

**AUSTRALIA—NEW ZEALAND WANT YOU ! ! !** 50,000 Jobs! Paid Transportation! Latest information and Forms. \$1.00 Austco, Box 3623-E, Long Beach, California 90803.

**OVERSEAS JOBS**—Now Hiring. 103 Countries. All Occupations. High Pay. Free Transportation. Tax Benefits. Latest Computerized Reports—\$2.00. **TRANSWORLD**, International Airport, Box 90802-E, Los Angeles, California 90009.

**FREE** transportation! **AUSTRALIA** employment book. All skills needed. Latest information. \$1.00 guaranteed. Wayne & Co. Box 37350, Jacksonville, Fla. 32205.

**AUSTRALIA Needs YOU.** Over 1000 Jobs. Complete details \$1.98. Carnalea-503, Box 1711, Dallas, Texas 75221.

**AUSTRALIA Needs YOU!** Jobs, Jobs—All Skills. Government Paid Passage. Complete Details—Wages, Housing, Farming, Schools, Recreation, Rents, Taxes—Plus Giant Employers List. Send \$1.00 (Refundable) To Apollo Co., P.O. Box 148-M, Boston, Mass. 02101.

**AUSTRALIAN** Jobs, Opportunities, Employers Lists, \$1.00 info. Box-263-Galesburg, Illinois 61401.

**FLORIDA** Jobs Available Daily. Hundreds Listed Weekly Many Kinds. Sample \$2.00. Satisfaction guaranteed. Adlist, Box 11208, Brookier, Fla. 32622.

**GET** Completed Details for Australia. No-Nonsense \$1.00 info. Giant new Employment Directory. Rush \$2.98. Refundable. Marathon Enterprises, Box 6833, Jersey City, NJ 07306.

**SOUTHERN AFRICA.** Land of Gold. Booming Economy. No Unemployment. Paid Transportation. Complete Guide Airmailed \$2.00. Conway Employment, Box 127, Fish Hook 7975, South Africa.

**MODERN AUSTRALIA** For Australian Information & Employment Brochure. Please Forward \$5.00 to B. R. Jacquot, P. O. Box 697, Chula Vista, Ca. 92012.

**FOREIGN CIVILIAN JOBS.** Information: Foreign assignments, American companies, All occupations. Indicate type work or degree. CMA: Publications, Dept D, P.O. Box 10412, Birmingham, Alabama 35201.

(Continued on next page)



## EMPLOYMENT INFORMATION

(Continued from preceding page)

**AUSTRALIA** Wants you and your family! Jobs . . . Paid transportation. Complete details. \$1.00. Russ L. Jacobs Company, Box 48605, Los Angeles, California 90048.

**RESUME Kit**—New 20-page booklet by veteran placement executive. Full instructions, work sheets, Sample resumes. Satisfaction guaranteed. \$5.00. Resume Kit, Box 1091, New Milford, Connecticut 06776.

## HELP WANTED

**CALIFORNIA** Jobs—Engineers, Machinists, Electronics. Weekly list companies hiring \$3.00. Dynamics, Box 1867, Covina, CA 91722.

**OVERSEAS EMPLOYMENT** . . . Europe, Australia, South America, Asia! All Occupations! \$700 - \$4,000 monthly! Employment International, Box 29217-AH, Indianapolis, Indiana 46229.

**EARN** At Home Addressing Mail. Details 25¢ and Stamped Envelope. Deeco-151, Box 9308, North Hollywood, Cal. 91609.

## REAL ESTATE & FARMS

**NEW! FREE CATALOG!** Exciting Fall-Holidays edition of rural property! Over 5,400 NEW Properties described, pictured—Land, Farms, Homes, Businesses—Recreation, Retirement. Selected Best throughout the U.S.! 75 Years' service—700 Offices, 42 states Coast to Coast. Mailed FREE from the World's Largest! STROUT REALTY, Inc., 7-MX S. Dearborn, Chicago, Ill. 60603.

**CANADIAN LAND FROM \$35.00 AN ACRE.** Choice properties across Canada. Low monthly payments. Ideal for cottages, hunting, fishing, investment. Free catalogue. Canadian Estate Land, 286 Lawrence Avenue West, Toronto, Canada, M5M 3A8.

**BIG . . . NEW . . . FREE . . . FALL CATALOG!** Over 2,600 top values coast to coast! UNITED FARM AGENCY, 612-PM West 47th, Kansas City, Mo. 64112.

**MAKE \$500-\$1500 MORE** On the Sale of Your House. Complete Details \$5.00 Money Back Guarantee. CAN DO . . . 26 Crocker Avenue, Johnson City, New York 13790.

**\$5 ACRE.** Canadian Border—hundreds campsites, islands, farmlands, directly from tax authorities. (Non-profit). Lists, photographs mailed. Register, Room 10, 110 Church Street, Toronto 1, Ont. Canada

**\$3.50 ACRE! USA and Canada.** Lists, photographs mailed. Government Lands, 220-PM Delaware, Buffalo, New York 14202.

**"CANADIAN Country Acres and Lots."** Our 60th year. Free catalogue. Tax Sale Service, Room 301-PM, 85 Bloor Street, East, Toronto, Ontario M4W 1B5.

**CENTRAL Ontario—Choice 640 acre Sportsmen's** paradise still available—\$20.00 plus \$6.50 taxes yearly. Maps, pictures, \$2.00 (Refundable). Information Bureau, Norval 4, Ontario, Canada.

**WYOMING RANCH LAND.** 10 acres \$30 down, \$30 month. Owner—Mike Gauthier, 9418 Florence, Downey, Calif. 90240.

**ARKANSAS Farms Acreage Homes.** Free List. American Farm Realtors, Drawer "C," Mena, Arkansas 71953.

## GARDENING & LAWN CARE

**SAVE MONEY** and TIME with amazing soil-less growing mixture. Grows plants faster in containers or outside beds. Economical, lightweight, odorless. Use local ingredients. Formula and complete instructions \$1.50. East Coast Greenhouses, Box 153, Kingstree, S. C. 29556.

**AMAZING Plant Growth Summer-Winter.** Make Hydroponic Unit From Materials At Hand. Details \$1.00. HBR&D, Box 3177, Redding, Calif. 96001.

## FARM & GARDEN EQUIPMENT

**HYDROPONIC GREENHOUSE.** Send for Details! Iott Engineering, 4660 73rd, La Mesa, Cal. 92041.

**VETERINARY Guide to Farmers.** The only book of its kind. Send \$6.95 to: POPULAR MECHANICS, Dept. VG, Box 1014, Radio City, New York, N.Y. 10019.

## FLOWERS, PLANTS, & NURSERY SUPPLIES

**LEARN** Landscaping and the growing of plants. Start a profitable business part or full time. Free information without obligation. Lifetime Career Schools, Dept. A-834, 2251 Barry Avenue, Los Angeles, California 90064.

**FREE** Samples, Literature From Our Flower Pot Sale. Send \$1.00 (postage and handling). Floripot, Box 34, Bethel, ME. 55005.

## CONSTRUCTION PLANS, BLUEPRINTS

**HOUSE EXPANSION PLANS** And detail instruction book provide anything from an extra room to 1000 s./t addition. Build what you need at big do-it-yourself saving. Book with 1 set working blueprints \$14.50! With 4 sets (required by contractors) \$20.00. Money-Saver Projects, Box 303-448, Chappaqua,

## LOG CABINS AND "A" FRAMES

**BUILD** Log Cabins, Rustic furniture, Fireplaces!! Complete manual \$3.00 . . . "A" Frame plans, \$2.00 . . . Guaranteed. . . . Beels, 956 Springdale, Atlanta, Georgia 30306.

**"A" FRAME CABIN.** 1184 square feet: \$1950. material. Purchase locally. Complete plans, instruction manual & material list: \$5.00, Moneyback guarantee. Plan #4901. "Dependable Products", Box 113, Vista, California 92083.

**NATURAL STONE HOUSE.** Gather Rocks Free, Build In One Summer! Need Pickup, Hand Tools—No experience! Guaranteed "HOUSE OF STONE" manual, \$3.00. Stonehouse 170, Sweet, Idaho 83670.

## HOME CRAFTSMAN

**WOOD**—Domestic and Imported Hardwoods! 3500 items! Clock, musical instrument kit. Tools . . . discount prices! Hard-to-find hardware. 144 page catalog, 50¢. Craftsman, Dept. AX-85, 2729 Mary, Chicago, Illinois 60608.

**101 PATTERNS,** Gifts, Novelties, Shelves, Action Windmills, plus "Make Money Jig Sawing". \$2.00. Mastercraft, 85M, P.O. Box 631, Park Ridge, Illinois 60068.

**CLOCK MOVEMENTS:** Westminster Chime, Pendulums, Conventional, Dials, Accessories. Free Catalog. Klockit, Box 629, Lake Geneva, Wisconsin 53147.

**HOW To Make Kitchen Cabinet's and Furniture.** New illustrated Manual shows you the latest and easiest step by step Methods. Guaranteed Satisfaction. Write: Flint Woodworking, 1027 Mansfield City Road, Storrs, CT. 06268.

**CATALOG FULL SIZE FURNITURE PLANS**—\$1.00 Refunded with first order. Traditional Early American, over 150! Furniture Designs, 1425 Sherman, Dept. CP-75, Evanston, Illinois 60201.

**CABINETMAKING MADE EASY** And "How to Make Formica Counter Tops." Two excellent guides let you build kitchen cabinets and counter tops like professionals. Extraordinary guides bring master craftsmen's shortcut methods. Satisfaction guaranteed. Write: Japs, 126-P Seventh North, Hopkins, Minn. 55343.

**PICTURE Framing**—Profitable full or spare-time business. Easy to learn with handbook-course "Guide To Picture Framing Profits." \$2.00 Guaranteed. Free framing-supplies catalog included. Japs, 126-PM Seventh North, Hopkins, Minnesota 55343.

**PLANTERS**—(Hanging/Floor), Architect Designed, Easy To Make For Fun And Profit. 10 Plans \$2.00. Planters, Box 367, Waterford, Michigan 48095.

**BEGINNERS** Can learn woodworking in 25 lesson projects. Free details. Old Craftsman, 16115 Burton Court, Livonia, Michigan 48154.

**COMPLETE CABINET PLANS!** Designed for all kitchens and bathrooms. \$6.00. Creations II, Box 184, Danville, CA. 94526.

**FREE ENERGY!** Sources of Supplies, plans, windmills, solar, methane, etc. Send \$2.00. PER-O, 15 Riverside, Saginaw, MI 48602.

**VENEER Bargain!** 25 Square Feet Walnut, \$7.00 Post-paid. Guaranteed! "How To Create Veneered Masterpieces, Bond Unusual Veneers Simply, Instantly!" Illustrated Manual/Catalog FREE. Morgan, P01K23, Box 18169, Louisville, Kentucky, 40218.

**TUBECRAFT.** An Introduction to tubing and tube bending. Instructions for materials, tools, fundamental operations finishing, drawings for suggested projects. Send \$3.00. Creative Tubing, Box 264, New Haven, Indiana 46674.

**"INGENIOUS** Indexing Lathe Attachment. Plans \$10.00. Roseman, 166 Palm, San Francisco 94118."

**PM'S GREAT, NEW MASTER HOME CARE GUIDE.** The Latest and Greatest In The Popular Mechanics Master Guide Series. Lays Out All You Need To Know About Home Repairs, From Basement Waterproofing to Roof Repair. 24 Laminated, Wipe-Clean Sheets on 12 Stand-Up, Hang-Up Boards. 150 Charts and Illustrations. Properly used, it can save thousands of dollars. \$4.49 ppd. PM Master Home Care Guide, Dept. HE, Box 1014, Radio City, N.Y. 10019.

## DO-IT-YOURSELF

**CUT UTILITY BILLS.** 50 ways includes Solar Energy Plus Bonus \$4.00. Pastuszek, 2331 Mole Road, Clifton Heights, Penna. 19018.

**ELECTRIC POWER FROM THE WIND.** 40-page illustrated booklet plus new catalog. Send \$2.00; SOLAR WIND, P.O. Box 7A, East Holden, Maine 04429.

**WEIGHTLIFTING EXERCISER** From ordinary lumber, hardware. Plans \$3.00. "Myty-Moe", 37 N. Orange, Orlando, Fla. 32801.

**SAVE THOUSANDS.** Contract Your Own Home. Free Details, "Home", Box 3056, Seattle, Washington 98114.

**AMAZING** Electronic Products Pocket Laser. See-in-the Dark, Radio Scramblers, penlight Strobe, Bug Detectors, TV Disruptor, Many More, All New Catalog \$1. Information Unlimited, West St., Milford, New Hampshire 03055.

**1400 CATALOGS** Listed and Described Sources for EVERYTHING Imaginable! Rush \$2.00. MASTERLOG, Box 24413-YT, Oakland, California 94623.

**STOP LEAKS.** Liquid elastic stops leaks on any surface. Excellent for roofs and basement walls. Protects and beautifies. Eight attractive colors. Easy to apply. For free information call or write. (312) 568-3111 U.S. Polycast, Corp.—850 West 119th Street—Dept. 101

**PLANS** For Childrens combination toy box, chalk board and book case. Send \$2.00 to Plans, Box 88452, Tukwila, Wash. 98188.

**STOPS-HEAT, FADE, GLARE.** Conserve Energy! Insulate Your Glass Windows And Doors. Apply Reflective Window Film To Existing Glass. Saves On Airconditioning And Heating Cost. No Adhesive Or Special Tools Needed. Turns Ordinary Glass Into One-Way Mirror. Used In Store-Office-Apartment-Resident-Car-Van-Boat. Complete Kit! 18" x 10'-\$15.95; 26" x 5'-\$11.95; 36" x 6'-\$19.95. Sample, Brochure Send 50¢—Central Florida Sun Control, Rt. 1, Box 70, Lake Placid, Florida 33852.

**FREEZER** Convert refrigerator to upright freezer. Plans \$5.00—Kit \$30.00. Appliance, 781 Greenland, Cookeville, Tennessee 38501.

**SAVE MONEY,** hot water, fuel, Reduce electric and water bills. Shower control installs in seconds. Rush \$1.79. Floyd Williams, Rt. 2, Box 957, Monroe, N.C. 28110.

**ELECTROPLATING.** Complete amateur's textbook All metals Electroplate metallic/nonmetallic items \$7.00. Details free. Tropic, Box 95P7, Palm Bay, Fla. 32905.

**SMOKE** Beef, Fowl and Fish in your own easy-to-build smoker. Complete direction booklet. \$5.00 to Smoker, Box 590, Burlington, Kansas 66839.

**FREE** Solar Energy Catalogue. Send stamp. Centerline, 401Y South 36th Street, Phoenix, Arizona 85034.

**HOW** To make delicious wine and champagne at home using only kitchen equipment. Complete details—recipes \$3.98. Carnalea-501, Box 1711, Dallas, Texas 75221.

**WIND**—Solar Power. Valuable information, 10¢. Energycraft, 2350 W47AF, Denver, Co 80211.

**SOLAR** Energy Directory Current Suppliers of Information. Plans, Components \$3.00. Wilder, Box 97, Silver Springs, FL 32588.

**COMPRESSORS**—Air—From Salvage Information. Write: Ruhmann, Box 69, Mt. Carmel, Pa. 17851.

**FREE** Lifetime Energy!!! Solar/Wind Energy!! Details, Manufacturers, \$2.50. Moneyback Guarantee. Bilmor Sales, 8225M I Encino, Northridge, Calif. 91324.

**SAVE!** Install Central Air Conditioning Yourself. Send \$1.00 For Detailed Instructions. Box 3329, Longwood, Florida 32750.

**"MOCK ROCK"** Fantastic, quick and easy new craft! Make gorgeous decorator "stone" or "brick" wall yourself from inexpensive, easily obtained materials. Ten foot wall costs about \$30.00. Complete photo instruction book only \$3.00. Bronel Co., Box 25504, Milwaukee, Wisconsin 53225.

**GARDEN** without soil! Small space. High yield. Year around. Write: E & M Specialties, A85, Box 11356, Albuquerque, New Mexico 87112.

**FIBERGLASS GREENHOUSE**—8' x 8' Build yourself for under \$250.00. Have fun gardening year-round. For detailed plans send \$7.50 to: Bricher Associates, 19400 Hickory Ridge, Fenton, Michigan 48430.

**IF YOU** Have the dough to buy a \$200.00 workbench, buy it. If not, send \$1.00 for our poor-man's workbench plan and build your own for less than \$30.00. Full instructions and material list. Way-Mar, 58 Underhill Road, Scarsdale, N.Y. 10583.

**SOLAR** Heating guide. One Dollar. B. Saunders, 63 Wilder, Keene, NH 03431.

**ENERGY** Saving Plans, Windmills, Electric Cars, Waterwheels, Solar Heat, etc. Save for Information, List. Goodman Associates, 4 Berryville Pike, Summit Point, WV 25446.

**PM'S FAMOUS MASTER SHOP GUIDE.** One of The Most Important Tools You'll Ever Own! Lays Out Everything You Need To Know About Nails, Screws, Bolts, Drills, Adhesives, Ladders, Masonry, Plumbing and Electrical Work. 24 Stand-Up, Hang-Up, Wipe-Clean Laminated Pages. 56 Charts plus a Built-In Ruler, Protractor and Compass. Solid Value at \$4.49 ppd. PM Master Shop Guide, Dept. HE, Box 1014, Radio City, N.Y. 10019.

## REPRODUCTION MOLDS

**MOLDS** For Ornamental Concrete. Our Catalog Contains Over 700 rubber and fiberglass molds. Catalog \$2.00. Pycrete Mold Co., Elk Rapids, Mich. 49629.

**FIBERGLASS/Latex** Molds for casting Ornamental Concrete and/or plaster. Catalog \$2.00. Freeman Industries, Joliet, Montana 59041.

## ARTS & CRAFTS

**RETAILER WANTS HOME CRAFTED OBJECTS.** Details \$2.00. James Willoughby, Box 121, Watervliet, Michigan 49098.

**LIQUID LATEX** Paratol. 706-G compound for making rubber mold. Toughest, finest quality. Instructions. Money-back guarantee. Postpaid \$3.95 quart, \$12.00 gallon. Testworth Laboratories, Inc., 401 S. Main St., Columbia City, IN 46725.

**LARGEST** Handicrafts Supply Directory \$3.00. R.P.H., 924 Winter Street, Stamford, Conn. 06905.

**LEATHERCRAFT** Catalog. Tools, Leather, Dyes, Dressings, Saddle Stamps, Buckles, much more. Send 25¢ to MacPherson Bros., P.O. Box 395, San Francisco, Calif. 94109.

**GLASS BLOWING** Kits and Supplies—Literature Upon Request—Willis Glass, P.O. Box 3460, Anaheim, California 92803.

(Continued on next page)



## ARTS & CRAFTS (Continued from preceding page)

**MAKE** Figurines, plaques, lawn ornaments. Molds, plastercraft kits, liquid rubber. Sample and catalogue 25¢. Woolley Company, Box 29-B, Peoria, Illinois 61601.

**"GETTING Started in Stained Glass"** 25¢. Whittemore, Box 2065Y, Hanover, Mass. 02339.

**EASY—Make Beautiful HAWAIIAN Jewelry!** Puka Shell, Heishi, Coral. Much more. Instruction manual \$2.00. Supplies, Kits, Kawika's, 4132-4 Keanu, Honolulu, Hawaii 96816.

**LIMITED** Edition art prints, reasonable. Guaranteed. Free Information. Images, PM95, 3808 Broadway, Kansas City, Missouri 64111.

## CAMERAS AND EQUIPMENT

**FREE! FREE! BARGAIN BOOK.** Central Camera Co., Dept. 381, 230 S. Wabash, Chicago, Ill. 60604.

**BUILD** Your Own Underwater Camera Case. Complete Plans, \$3.00. E.R.P., Box 98943, Des Moines, Washington 98188.

**COLLECT** Old Cameras, Profitable, Fun. Details \$1.00. Emmett, Box 91 Q, Cardington, OH. 43315.

## PHOTO & PHOTO SUPPLIES

**40-PG. PHOTO MAIL ORDER CATALOG—YOURS FREE!** Send name, address to: Michael's Camera Shop, Park City, Lancaster, PA. 17601.

## PHOTO FINISHING

**LOOK!**—Special Money Saving Offer! Kodacolor Rolls developed with Jumbo Size Prints \$1.60. B&W 49¢. Big Discounts on supplies. Enclose advertisement. Wisconsin Film Service, LaCrosse, Wisconsin 54601.

## COLOR SLIDES

**FREE** 35MM Color Slide Encyclopedia. Same slides used in TV, national magazines. 126 pages individual listings. Write Wolfe Worldwide Films, Dept. 14-85, Los Angeles, Ca. 90025.

**GAF** Color Slides. All countries. Catalog 25¢ Worldwide, 7427-M Washburn, Minneapolis, Minn. 55423.

## MOTION PICTURES & SOUND EQUIPMENT

**175-FT. 8MM. CLASSIC SAMPLER . . . ONLY \$1.95.** Highlights from heyday of the silent! Chaplin, Laurel & Hardy, Fairbanks, Keystone Kops, Glen, Pickford, Chaney, the first Indianapolis 500 and more. Order today . . . specify standard or super-8. Free catalog: 8MM, & 16MM. movies & 35MM. 2" x 2" color slides. Blackhawk Films, 1678 Eastin-Phelan Bldg., Davenport, Iowa 52808.

**UNUSUAL** Movie supplies. Free circular, Esor, 47th Holly, Kansas City, Missouri 64112.

**8MM—SUPER 8—16MM MOVIES!** Biggest Selection! Lowest Prices! Free Catalog! Cinema Eight, Box PM, Chester, Connecticut 06412.

**SUPER 8MM, 16mm, 8mm** silent and sound film classics. Free catalog. NILES, 1141PM Mishawaka, South Bend, Ind. 46615.

**SUPER 8, 8mm, 16mm, 35mm, B&W and Color Film.** Supplies, Processing Equipment. Send 25¢ for 84-page catalog refundable with order. Superior, 448 N. Wells, Chicago 60610.

**COLUMBIA** Home Movies Catalog—G & G Films, Box 321, Syosset, N.Y. 11791.

## RADIO, TELEVISION & HAM EQUIPMENT

**FREE** Educational Electronics catalog. EduKits Workshop Department 747B, Hewlett, N.Y. 11557.

**RADIO** Tubes, 1924 to 1974. Preller T.V., Augusta, Ark., 72006. (501) 347-2281.

**CANADIAN** Catalogs—Giant Savings, Surplus, Clear-outs, Bankruptcy Stocks, Factory Deals. Rush \$1.00. Etco-PM, Box 741, Montreal "A".

**36¢ RADIO & TV Tubes.** Free catalog. Cornell, 4213-17 University, San Diego, California 92105.

**500 MILE** Daytime B.C. Reception. Plans—Kits—Tuners. SASE. Supercieve, 2555 Sykes, Rogue River, OR. 97537.

**UNDERSTAND** POLICE RADIO CONVERSATIONS 10 Code and Meanings, \$3.00 per List. John McCorkel, 3440 Burr St., Gary, Ind. 46406.

**GOVERNMENT** Surplus receivers, transmitters, sniperscopes, parts. Catalog 25¢. Meshna, Nahant, Mass. 01908.

**AMATEUR** Equipment Wanted For Handicapped People In Israel. Please Send Whatever you have to: Olivecrafts, 43 Chetetzchaim, Petah, Tiqua Israel.

## HIFI, TAPES, & RECORDS

**SAVE 50%.** Construct speakers and save money. Send for free catalog and instructions. **SPEAKERKIT**, Box 12M, Menomonie, WI 54751.

**FREE** Catalog—Electronic Kits—Amplifiers—Pre-amplifiers—Psychedelic Strokes—SCA Adaptors—Color Organs—Digital Instruments—Guitar Amplifiers. **FREE** Subscriptions. SWTPC, Box PM32040, San Antonio, Texas 78284.

**8-TRACK** Fidelity Stereo Tapes. Any Top Rock, Oldies, Radio Shows, Humor, Party. \$3.50 you name it. List 50¢ (refundable). DiWan Company, Box 1302, Springfield, IL 62705.

**OLDIES** 45 RPM Original Hits—Catalog 50¢. C&S Record Sales, Box 197, Wampsville, New York 13161.

**OLD** Radio Programs. Thousands Available! Huge Catalog \$1.00! Radio Vault, Box 9032-Z, Wyoming, Michigan 49509.

**COMPLETE** Stock of 8-TRACK tapes prerecorded and blank Stereo equipment and accessories available. Discount prices. Free catalog. Victory Tape Sales, 2646 N.E. 189th Terrace, N. Miami Beach, Fla. 33160.

**CASSETTE** Recording Tapes. Discount Price List 25¢. Tower, #33098, Washington 20028.

**GOLDEN** Age Radio. Complete taped Shows. Box 25215-M, Portland, Oregon 97225.

**FREE** Catalogue. 2500 Rare Collectors Records, Rose's Records, Box 7216, Louisville, Ky. 40207.

## MUSIC INSTRUCTIONS & INSTRUMENTS

**ACCORDIONS**—Famous makes. 40 models. 5 Day Home Trial. Easy terms. Trades. Free Catalogs! Money saving Importer-to-You Price List. Write: Accordion Corporation, Dept. R, 5535 Belmont, Chicago 60641.

**VIOLIN**, guitar, cello, dulcimer makers & repairers join International Violin Co. new owner celebration. Now buy direct from new 1975 catalog. Big savings, below retail store prices. Catalog features largest selection of first quality woods, parts, supplies, complete kits, finished string instruments. For free catalog write: International Violin Co., Dept. PP, 4026 W. Belvedere Ave., Baltimore, Md. 21215.

**ACCORDION** Top Brands. Cordovox. Buy direct. Tremendous discounts. Trades accepted. Free brochure PM. Accordion-O-Rama, 874 Broadway, N.Y.C. 10003.

**30% TO 50% DISCOUNT!** Any Model! Guitar, Amp, Drum, Banjo. Dobro! Free Catalog! Warehouse P60, Box 11449, Fort Worth, Texas 76109.

**WHOLESALE.** Musical Instruments—Accessories. Allied, 573 Route 17, Paramus, New Jersey 07652.

**KITS!** Build dulcimers, guitars, harps, banjos, mandolins. From \$2.95. Finished instruments from \$23.95. Free catalog. 8665 West 13th-PM, Denver, Colorado 80215.

**STRINGS!** Accessories. Parts. Discounts. **FREE** Catalog. Stringing M8, Box 5444 Lindenhill, Flushing, N.Y. 11354.

**EASY** To Play And Make. Quality Dulcimers, Banjos, Thumb Planos; Instruments And Kits. Can Be Profitable Hobby. **HERE**, Inc. #P, 410 Cedar Avenue, Minneapolis, Minn. 55404.

**WHOLESALE!** Professional Guitars, PA Systems, Altec Speakers, 240W RMS Amplifiers. Free Catalog. Carvin, Escondido, Calif. 92027.

**POEMS** Wanted for songs. Nashville Music Productions, Box 40001-P, Nashville, Tennessee 37204.

**PLAYER PIANOS; PUMP ORGANS**—books; repair manuals. Catalog \$1.00. refundable first order. Vestal Press, Box 97, Vestal 11, NY 13850.

**LEARN** To Play Piano—Guitar—Accordion My Way. Write: Hall's, Box 181PM, Lynwood, California 90262.

**LEARN** Banjo. 5-String Bluegrass. No music. Makes learning easy. Free details. Blaylock, Box 25-M, Marietta, Georgia 30060.

**UP TO 60% Discount** Name Brand Instruments. Catalog. Freeport Music, 455F. Route 110, Melville, N.Y. 11746.

**ACCORDIONS** Manufacturing, 6846-P North, Chicago 60635. Concertinas - Chromatics - Heligons - Hohners - New - Used - Repairing - Wholesale Catalogs Free.

**POEMS** Songs wanted. Recording. Publishing guaranteed. Royalties. Radio-TV release. Broadway Music, Box 7438-PM, Sarasota, Fla. 33578.

**13 MUSICAL** instrument kits, solid walnut, spruce. Rembrand Company, RR3, Newton, Iowa 50208.

**ELECTRIFY** Player Pianos, Pump Organs Quickly, inexpensively with Lee Silent Suction Units. Write: Lee Music, 525F Venezuela Avenue, Venice, California 90291.

**GUITAR**, Banjo, Violin, Mandolin Making Materials, Accessories, Books. Catalog 25¢. Guitar Center, Box 15444, Tulsa, Oklahoma 74115.

## EDUCATION & INSTRUCTIONS

**WELDING** TRAINING Basic and Advanced Training for Major Processes—Arc, Gas, Pipe, TIG MIG, Plasma. Hobart, a non-profit school, is accredited member NATS. Approved Ohio 70-12-0064 MT. Write for school bulletin and course schedule. **HOBART SCHOOL OF WELDING TECHNOLOGY**, Box 75, Troy, Ohio 45373.

**SURVEYING** PAYS BIG!!! United States Department of Labor reports "openings for 26,000 Surveyors in next ten years." Easy home-study plan guides you. Send for Free "Surveying Career Kit." North American School of Surveying, Dept. PBC75, Newport Beach, California 92663.

**UPHOLSTERY** Decorating. Free Booklet. Learn at home. Upholstery Decorating School, Dept. 5310-085, Little Falls, N.J. 07424.

**VETERINARY ASSISTANT**—Train at home for exciting animal care career. Send for **FREE "Career Kit"**. North American School of Animal Sciences, Dept. PBC75, Little Falls, N.J. 07424.

**LEARN** to fix typewriters and office machines. Many trained men needed. Make up to \$25.00 in one hour on overhaul. Learn at home in spare time. Facts Free. Send name. Typewriter Repair School (home-study), Dept. 3310-085, Little Falls, N.J. 07424.

**EXTENSION** And Post-Graduate Awards in Philosophy, Art, Science, Botanic Medicine, Homeopathy, Radiomics and others. 30 subjects. Curricular free (airmail \$1.00 refundable). Registrar, Sussex College of Technology, Highfield, Danehill Sussex, England.

**NOW! YOUR OWN BURGLAR/FIRE ALARM BUSINESS** OR alarm installation position through training at home. Great demand, rapidly expanding field. Full information by mail, no salesman. Security Systems Management School (homestudy), Dept. 7310-085, Little Falls, N.J. 07424.

**EARN WHILE YOU LEARN** At Home in Your Spare Time. Modern Outdoor Equipment Repair School (Coleman and others). Dept. PME, 4225 N. Brown Ave., Scottsdale, Arizona 85251.

**WANTED** "Unknown Definition of God" Amazing report reveals how to unlock Bible's tremendous creative force. Forge ahead. \$7.00. Lakewood Products, Dept. SCIA, Box 29, Jamaica New York 11435.

**AMATEUR** Radio. Complete correspondence Code and Theory license courses. Ron Reed Electronics Institute, 12217 Santa Monica Boulevard, Los Angeles, Calif. 90025.

**SMALL ENGINE REPAIR**—Earn And Learn At Home. (Briggs & Stratton and others). Modern Small Engine Repair School, Dept. PMR, 4225 N. Brown Ave., Scottsdale, Arizona 85251.

**COMPLETE YOUR HIGH SCHOOL** At Home in Spare Time. Texts Furnished. No Classes. Our Diploma Awarded. Our 78th Year. Free Brochure. American School, Dept. XC45, Drexel at 58th, Chicago 60637.

**EARN WHILE YOU LEARN** At Home in Your Spare Time. Send For Brochure, Full Facts. Modern Gun Repair School, Dept. PM, 4225 N. Brown Ave., Scottsdale, Arizona 85251.

**LEARN ACCOUNTING!** U.S. Labor Department reports "33,000 NEW Accountants, 78,000 NEW Bookkeepers needed EACH YEAR for next ten years". Easy home-study plan prepares you. Approved for Veterans. Send for **FREE "Accounting Career Kit"**. North American School of Accounting, Dept. PBC55, Newport Beach, California 92663.

**SMALL ENGINE REPAIR**—Earn and learn at home. Modern Small Engine Repair School, Dept. P, 4225 N. Brown Ave., Scottsdale, Arizona 85251.

**LEARN** Asleep or awake! Records, tapes, equipment! Free catalog! Drawer PM-400, Ruidoso, New Mexico 88345.

**BARTENDING** Bar Management Course. Free Information. Universal Academy, Box 8180-AB, Universal City, California 91608.

**COLLEGE** Degrees at home. Choice of subjects. Easy tuition. Free inf. Elysion College, B. C. Box 909, San Ysidro, Cal. 92173.

**ACCOUNTING CAREER.** Many make \$1,200 monthly. You start, only 20 lessons, \$5.00 each. Pay as you learn and earn. State approved. Certificate. Start by Mailing \$5.00 for first lesson. Jenkins, Box 571, Taft, California, 93268.

**RADIESTHESIA**, Radionics, Dowsing. E.S.P. Courses and Equipment. Illustrated Catalog \$1.00 (refundable) Established 27 years. Dept PM/RH Bruce Copen. Highfield, Danehill, Sussex, England RH17 7EX.

**AUCTIONEERING**, Resident or home Study Course. Free Catalog. Nashville Auction School, 1921 West End, Nashville, Tennessee 37203.

**AUTOSUGGESTION**. Sleep-learning headquarters! Tapes, records, books. Gigantic catalog free. Research Association, Box 24PM, Olympia, Washington 98501.

**DETECTIVE**—Training Course. American Detective Institute, Box 418-A, Fairfield, Alabama 35064.

**RELIGIOUS VOCATION** Write: Church of Holy Light Inc., P.O. Box 4478, Pittsburgh, Pa. 15205.

**USED** Courses! Books! List 10¢. Smith's, 124 Marlborough, Salem, Massachusetts 01970.

**OWN** Collection agency. "Little Gold Mine!" Franklin Credit, Roanoke, Virginia 24004.

**PIANO** Tuning quickly learned with home study course. Diploma granted. American Tuning School, 17050 Teller Dr., Morgan Hill, California 95037.

**DETECTIVE** Profession. Easy home study; free tie-back or lapel pin, certificate, future, GI approved. Professional Investigators. Box 41345, Dept. CP, Los Angeles, Calif. 90041.

**LEARN** Auctioneering. Term soon. Free Catalog. Reich World Wide College of Auctioneering, Inc., Box 919, Mason City, Iowa 50401.

**EARN ELECTRONICS DEGREE** by correspondence. Free brochure. Grantham, 2004 Stoner, Los Angeles, California 90025.

**LEARN** Sewing Machine Repairing. Men, Women. Lucrative profits. Profession with bright future. Gresslin Correspondence School, Box 927, Spencer, Iowa 51301.

**PROBLEMS?** There's an Answer! Free Home Study by Mail in the Torah or Confraternity New Testament. Please state your Religion. Lamplight Studios, Box 88-D, Brooklyn, New York 11229.

**DETECTIVE** Course. Free Information. Universal Detectives, Box 8180-F, Universal City, California 91608.

(Continued on next page)



## EDUCATION & INSTRUCTIONS

(Continued from preceding page)

**PIANO Technology**—Electronic organ servicing, learned easily at home. G.I. Approved. Free booklet. Niles Bryant School, Dept. P, 3631 Stockton, Sacramento, California 95820.

**WATCH REPAIRING.** 35 Lesson Home Study Course. Free sample. Diploma awarded. Chicago School of Watchmaking, Dept. YV, Fox River Grove, Illinois 60021.

**FREE Lifetime Ordination.** Become Chaplain Missionary. Bishop, Box 744, McKeesport, Pa. 15134.

**PARAPSYCHOLOGY.** Complete Study Course, Certificate. Free Information. American Parapsychological Research Foundation, Box 5395-BB, Sherman Oaks, Calif. 91413.

**PENMANSHIP Corrector.** Improve Poor Penmanship Quickly. Details Free. Thurmon, Box 824, Stinnett, Texas 79083.

**INSTANT MEMORY.** . . . New way to remember. No memorization. Release "photographic" memory. Forget nothing! Liberates extraordinary knowledge talents. ESP. Immediate results! Free information. Institute of Advanced Thinking, Box 606-PM, Pacific Palisades, California 90272.

**PRIVATE DETECTIVE Training manual.** \$2.00. "Professional Secrets." 3034 Walnut, Lincoln, NE. 68503.

**FREE Book** tells how you can learn camera repair and service. Home study or classroom. Write today! National Camera, Dept. EAD, Englewood, Colorado 80110.

**DETECTIVE Training Method.** Free Information. International Investigators, Box 982P, Palm Springs, California 92262.

**EARN WHILE YOU LEARN** Television Servicing. Simplified Proven Troubleshooting Procedures. Profusely Illustrated. Easily Understood. Send \$2.00 for First Lesson. Money Refunded If Not Satisfied. Electronics Learning Center, 4501 Cedros, #245C, Sherman Oaks, California 91403.

**AT LAST . . .** an excellent guide for self-improvement. Unique compendium of vital information covers business, people and self-related subjects. \$5.00. Business Insight Services, 902 Eastmont, Centralia, Missouri 65240.

**LEARN ELECTRONICS FAST!** You can begin secure high paying career within weeks. Includes test equipment, kits, tools. Diploma awarded. Amazing low price! Free Details. National Homestudy, Dept. PM8, 21733 Carriage Drive, South Bend, Indiana 46614.

**PYRAMID MIND CONTROL** Develop Super Memory, Concentration, Intuition. Fast—Easy. Develops E.S.P. Amazing Results. FREE Information. PMC 3205-M, Laurel, Manhattan Beach, CA. 90266.

**SCIENTIFIC Massage:** Big earnings uncrowded profession. Learn spare time at home. Diploma awarded. Free Catalog. Write Anderson School, Dept. J-1CA, Princeton, Illinois 61356.

**CUSTOMIZE Vans, trucks, cars.** Learn profitable home business, spare time. Materials, tools included. Exteriors, interiors—painting, upholstery, special fittings. Free Career Plan. Customizing Center, Dept. PBC75, Newport, California 92663.

## FOR INVENTORS

**CONSIDERING A patent application?** Two dollars brings you Valuable money saving Procedures. Jado Mfg., 1224 E. Hayden, Pocatello, Idaho. 83201.

**INVENTORS**—If you have an invention for sale, patented or unpatented, write for free brochure outlining manufacturers requirements, royalty rates. Kessler Corporation, C-58-F, Fremont, Ohio 43420.

**FREE Fact sheet**—File for your own patent—Sell your own invention—For complete kit and instructions send \$10.00. Krag Storm Co., 323 East 17th Street, New York, N.Y. 10003.

**INVENTORS—UNITED STATES PATENT OFFICE SEARCHES.** PATENT DEVELOPMENT Engineering and MARKETING of your inventions, ideas with MANUFACTURER CONTACTS. Send for FREE INVENTION CERTIFICATES and invention information. Serving inventors since 1948. GEORGE SPECTOR, LICENSED PROFESSIONAL ENGINEER—PATENT ENGINEER. Former UNITED STATES PATENT OFFICE EXAMINER—3615 Woolworth Building, New York, New York 10007.

**U.S. PATENT Office Searches.** 234 Broadway, Room 3615, New York 10007. Free invention certificates.

**INVENTORS:** Your ideas and inventions (patented/unpatented) expertly searched, developed for commercial appeal and cash/royalty sales to manufacturers by professional Invention Developer with excellent record of experience. B. S. Industrial Engineering. United States Patent Office former Patent Examiner. United States Government former Patent Advisor. Second decade reliable service! Member: United States Council International Chamber Commerce. Free "Invention Record" and "Recommended Protection Procedure." Airmailed! Write: Raymond Lee, Invention Developer, 230P-Park Ave., New York, New York 10017.

**FREE PAMPHLET:** "Tips on Safeguarding Your Invention." Write: United States Inventors Service Company, 501-P Thirteenth Street N.W., Washington, D.C. 20004.

**PATENT SEARCHERS** Includes maximum speed, full Airmail report, copies of closest patents. Quality searches expertly administered with complete secrecy guaranteed. Ask for Free Invention Protection Form and "Patent Information." Write Dept. 708, WASHINGTON PATENT OFFICE SEARCH BUREAU, 734 15th St., N.W. Washington, D.C. 20005.

## NEEDING Assistance? INVENTION DEVELOPMENT FOUNDATION, 155 Kent Street, Ottawa, Canada K1P 5P3.

**INVENTORS:** We represent companies wanting to buy patented products and inventions. Free information. THE EXCHANGE, Dept. M, Box 2290, Newport Beach, CA. 92663.

**U.S. PATENT OFFICE DRAWINGS.** Services Since 1945 Send Sketches with \$65.00: L.L. Hoffman Co., Inc., 420 Lexington Ave., New York, N.Y. 10017.

**INVENTORS.** Eliminate unnecessary fees and profit sharing. Reach large numbers of manufacturers directly and inexpensively. Free information. Dyrum, Box 285A, Rye, N.Y. 10580.

**\$10,000 For Your Invention!** For information write: George W. Smith, Box 8436, McConnell AFB, Wichita, Kansas 67221.

**INVENTOR'S SUCCESS KIT.** Amazing seldom revealed methods. Money-making facts free! Businessworld-B, 6363 Wilshire Blvd., Suite 124, Los Angeles, CA 90048.

**MR. INVENTOR: AMERICA'S FOREMOST BROKERAGE FIRM** offers a complete service for inventors. For an HONEST evaluation, FREE "Proof of Invention" PROTECTION forms and other important information WRITE: Charles S. Prince, Inc., Invention Consultant, 509-A 5th Avenue, NYC, 10017.

**IDEAS:** We Buy Ideas. For Information and SPECIAL PROTECTION Application To Submit YOUR IDEA For Review, Mail \$3.00 Creative Dynamics, Box 19446, Indianapolis, Indiana 46219.

**SEARCHES** With abstracts nearest patents \$18.00. "Filing Your Own Patent Applications." Step-by-step instructions, \$14.90. Professional Engineer, Box 8091 JFK, PO. Boston, Massachusetts 02114.

**INVENTOR'S PARADISE**—Combination Shows, Catalog Listing. FREE DETAILS To All Inquiries. Deadline Next Shows Soon. Paul Paulsen Jr., 401 So. Columbia, Frankfort, Ind. 46041.

**INVENTORS:** Only 5 of 100 Succeed. Will you? Find out. DETAILS FREE. AMERICAN TECHNOLOGY EXCHANGE, Suite 1202-EDP, 1006 Grand, Kansas City, Mo. 64106.

## INVENTIONS WANTED

**INVENTIONS** Wanted Immediately for promoting on cash or royalty. Patented, Un-Patented. Free booklet outlines royalty rates, requirements. Write Kessler Corporation, C-58-1W, Fremont, Ohio 43420.

**INVENTORS!** Protect your ideas! Free "Recommended Procedures." Washington Inventors Service, 422F Washington Building, District of Columbia 20005.

**FREE! LATEST DIRECTORY OF 500 CORPORATIONS SEEKING NEW PRODUCTS!** If you have an idea for a new product—or a way to make an old product better, send for our FREE INVENTORS KIT NO. A-84. It gives vital information on developing and marketing your invention/idea for Cash/Royalty Sales to corporations nationwide. Raymond Lee Organization, 230 Park Avenue, New York, N.Y. 10017.

**INVENTIONS MARKETING** Cash, Royalties FREE INVENTION PROTECTION CERTIFICATES. George Spector Manufacturers Representative, Woolworth Building, New York, N.Y. 10007.

**INVENTIONS IDEAS WANTED** Developed, Marketed by leading professional organization for Cash/Royalty sales. FREE EXAMINATION and CONFIDENTIAL REPORT of the Commercial Features of Your Patented/Unpatented invention. FREE COPY "How to Safeguard and Market your Invention to Industry" Write or Call: LAWRENCE PESKA ASSOCIATES, Dept. C, 500 Fifth Ave., N.Y.C. 10036, (212)354-9696, 150 S. Wacker Dr., Chicago, Ill. 60606, (312)346-1172, 1 Biscayne Tower, 2 So. Biscayne Blvd., Miami, Florida 33131. (305)358-1366, 44 Montgomery St., San Francisco, Calif. 94164 (415)956-1212, 1688 Century Park East, Los Angeles, Calif. 90067 (213)552-2020.

**INVENTORS! FREE BOOKLET LISTING 1,000 CORPORATIONS** Which may be interested in your invention. Many well-known manufacturers have engaged us to locate new products like yours. For Free INVENTORS KIT regarding the successful promotion of your invention or idea, contact: GILBERT ADAMS ORGANIZATION, Dept. 36H, 80 Wall Street, New York, N.Y. 10005.

**LET Me Finance your patent, product or idea.** Please Give Brief Description, E. Silger, Box 483, Tujunga, California 91606.

**HONGKONG Factory** needs 10-15 new products every month to satisfy their overseas buyers. Particularly interested household items, toys, games, gadgets. Please send sketches or detailed explanation for evaluation and cash/royalty purchase. If you have an article/accessory cannot produce domestically because of quantity, price or labour; please try us. Hongkong Plastic & Metal Products Company, P.O. Box 9027, Kwun Tong, Hongkong.

**INVENTORS:** Protect and Develop Your Ideas for Licensing or Sale to Manufacturers. Free information. Write: James M. Whitfield Co., Box 993, Harrisburg, Pa. 17108.

## MANUFACTURING

**INVENTORS** Ideas Developed, Research, Models. Manufacturing. Sales. Free Brochure. Since 1942. William Parker, Box 6305, Orlando, Fla. 32803.

## BUY IT WHOLESALE

**400,000 BARGAINS** Below Wholesale. Many Free! Liquidations . . . Closeouts . . . Job Lots . . . Single Samples. Free Details. Bargainhunters Opportunities, Box 730-A, Holland, Michigan 49423.

**HEARING Aids, batteries, Wholesale.** Catalog 25¢. Fiston, Box 1444, New Preston, Conn. 06777.

**WORLD'S Largest wholesale supply.** 7853 American. Foreign Wholesalers. Rockbottom prices. Hongkong Clothes. Automobiles. Japan electronics. Free details. International Buyers, Box 16386M, Portland, Oreg. 97233.

**SURGICAL GLOVES, \$3.00 DOZEN PAIRS, \$30.00** Gross Postpaid. Holly, 2033 Eastlawn, Akron, Ohio 44305.

**FANTASTIC Fashion Jewelry Wholesale Catalog—** 50¢. Chillemi's, Box 961, Lomita, Ca. 90717.

**40% OFF Parkas, Snowmobile And Ski Suits.** Write: Industrial Marketing, 7841 Wayzata Blvd., Minneapolis, Minnesota 55426.

**WHOLESALE Bargains.** Name brands. Jewelry, watches, calculators, novelties, furniture, appliances, etc. Free catalog. Olympic House, 34043B 51st Ave. So., Auburn, WA 98002.

## EXPORT—IMPORT

**LATEST U.S. AND WORLD IMPORT DROP-SHIP DIRECTORY.** Lists suppliers, products, and drop-ship prices. Only \$3.00. Troy Enterprises, Department DM-8, 1876 South Broad Street, Trenton, New Jersey 08610.

**IMPORT Manual Reveals Tricks of The Trade.** "Foreign Bargains." \$1.00. Leon Green, 6635 N. Seelye, Chicago, Ill. 60645.

**ORIGINAL Oil Paintings** \$96 Dozen, Color Brochure 25¢. McDaniel, 3632 Topax, Claymont, Delaware 19703.

## FOR THE HOME

**DAMP BASEMENT?** Book shows you how to fix it. GEPE, \$3.00 postpaid, Box 662, Elyria, Ohio 44035.

**FREE Catalog** Sea shells, Sea chests, Fishing rod racks, Brass Captain's bell, much more. George Fleming Sales, Dept. GPM1, 6111 N.W. 45th Ave., Ft. Lauderdale, Florida 33319.

## OF INTEREST TO ALL

**MAKE MONEY PLAYING POKER** Expert Reveals Inside Secrets. Learn How To Become A Constant Winner! Only \$2.00. Write: Mail Order Hunter Co., 1419 Sweetmann Avenue, Elmont, New York 11003. NEW YORK RESIDENTS ADD 8% SALES TAX.

**"SURVIVAL/Military"**—Books/Manuals Catalog 50¢. Survival Freeze Dried Storage Foods By The Case. List 50¢. Hale Supply (K-50), McDonald, Ohio 44437.

**BACKGAMMON!** America's hottest game sensation. Booklet reveals secrets for successful play. Send only \$1.50 plus 50¢ shipping to: The Wood Box, 2346 Westwood Road, N. Fort Myers, Fla. 33903. Fla. residents add 4% Sales Tax.

**FREE LIST!** Low Cost Books, Novelties Unlimited, 2730 Yonge #205E, Toronto, Canada M4N 2J1.

**CRIMEFIGHTERS!** Detectives-Police Catalog \$1.00 Don-Q, Box 548-PMO, Seattle, Washington 98111.

**\$800 MONTHLY** Possible addressing—stuffing envelopes (longhand-typing) your home. Experience unnecessary. Details, send stamped addressed envelope. American, Excelsior Springs, Mo. 64024.

**NEW Spare Time Fantastic Import-Export** Without Investing. \$1.00, MA Distinctive Gifts, 1101 East 4 Ave., Box 1561, Hialeah, Florida 33011.

**STOP SMOKING**—Permanently Fast-Safe-Effective. \$2.98. Carnalea-502, Box 1711, Dallas, Texas 75221.

**LIVE, LEARN, PROSPER.** Details 25¢. Wayne, Box 230PM2, Holtzville, N.Y. 11742.

**SAVE Every 8th Paycheck!** New easy way. \$1.00. Tom Tobin, Monticello, IL. 61856.

**DENIM FADER!** Enjoy the look-feel of aged jeans—create designs. Only \$4.95—two \$8.90. Barosch Enterprises, 1A8, 221-38 111. Avenue, Jamaica, NY 11429.

**AMAZING BUSINESSES** you can start at home. Free Details!!! UMC, PM85A, 8228 Wynne, Reseda, Calif. 91335.

## OF INTEREST TO WOMEN

**\$500 MONTH** Possible. Clipping Newspaper Items. Details Free, Sidney, Box 7423, Fort Worth, Texas 76111.

**\$500 MONTHLY** Possible clipping items from your newspaper. Experience unnecessary. Details, send stamped addressed envelope, American, Excelsior Springs, Mo. 64024.

## GIFT SHOPPING

**GIFTIME Catalog** \$1.00 Refundable. Newest items Made. Hanrahan Products, 7846-20th Ave., Kenosha, Wis. 53140.

**FREE Catalog!** High quality specialty imports. More than 40 items from African carvings to Electronic Alarms. R. R. Reedy Import-Export, P.O. Box 15011, Austin, Texas 78761.

**FREE!** Illustrated Catalog of inexpensive gifts. Write, Gifts Galore, 6023 Waverly, Dearborn Heights, MI. 48127.

## CLOCKS, WATCHES, OLD GOLD, JEWELRY

**DISCOUNT Jewelry Catalog** 50¢ (Refundable), JB, BOX 225, Inver Grove Heights, Minn. 55075.

(Continued on next page)



**CLOCKS, WATCHES, OLD GOLD, JEWELRY**

(Continued from preceding page)

**WATCH** and Clock repairing books, tools, materials. Free catalogs, North American, Box 77-AH, Fox River Grove, Illinois 60021.

**WANTED**—Gold, silver, platinum (any form). Coins. Information Free. Wilmet's, 3450 South Glassell, Orange, CA 92666.

**BEAUTIFUL** 31-day Pendulum Wall Clock. Rice's 107-B Thriftway Plaza, Ruskin, FL 33570.

**PUKA SHELLS**, Hawaii's Fashion Jewelry. Write: Kawiha, Box 8196, Honolulu, Hawaii 96815.

**CLOCK MOVEMENTS**—Battery Electric, Chime, Wall, Grandfather, Cuckoo. Use as replacements or design your own. Details 50¢. Clock Repair Center, Dept. 28, P.O. Box 65, Carlo Place, N.Y. 11514.

**HIGHEST** Cash immediately for Old Gold, Silver, Platinum, Jewelry, Gold Teeth, Watches, Diamonds, Spectacles. Free information. Rose Industries, 29-A East Madison, Chicago 60602.

**HEARING AIDS**

**HUGE SAVINGS**. Eliminate dealer mark-ups. Free Trial. Batteries Wholesale. Terms arranged. Lloyds-PMC, Rockford, Ill. 61104.

**FREE HEARING AID CATALOG**—Save by mail. Write: "MONEYSAVERS", 9530-PM-8, Langdon, Sepulveda, California 91343.

**HEARING AIDS**, Batteries, Discount Prices. Free Trial. Write: Rhodes, Brookport, Illinois 62910.

**HEARING AIDS**—Huge savings on tiny, all in the ear, eyeglass, behind the ear and body models. Free home trial. Low as \$10 monthly. Write for free catalog. Prestige, Dept. R-6, Box 10947, Houston, Texas 77018.

**TOBACCO**

**CUBAN** Cigars. Formerly made in Havana, now Hand-Rolled by Tampa's Master Craftsmen from finest imported tobaccos. Satisfaction Guaranteed. Free Brochure. Boutique, 8501-C Woodburn Court, Tampa, Florida 33615.

**HANDCARVED** Meerschaum Pipes Wholesale Catalog. Nichols, Box 3144, Enid, Oklahoma 73701.

**BRIAR, MEERSCHAUM**. Pipe making materials. Pimop, Box 59211, Chicago, Illinois 60659.

**MEERSCHAUM** Pipes—Free Catalog. Conner Imports, Box 9574-PMB, San Jose, Calif. 95157.

**FREE** Sample of our Best Selling tobacco, Bradley's, Dept. 2, 170 Cypress, Abilene, Texas 79601.

**BOHEMIAN** Pipes for Smoking Pleasure. Rice's, 107-G Thriftway Plaza, Ruskin, FL 33570.

**BRIAR PIPE** Make or repair your own. Photocopy of article shows you all the details. Price \$1.00 Send order to: POPULAR MECHANICS, Dept. HE, Box 1014, Radio City, New York, N.Y. 10019.

**CALCULATORS**

**TEXAS** Instruments Calculators Discount Hot Line Toll Free 800-638-8906. Phone us long distance free for the low discount price on the Texas Instruments Calculator of your choice: SR-50, SR-51, SR-16, TI-2500 II, TI-1500, TI-2500, TI-2550, TI-5050. All of the great new Texas Instruments models. Capital Calculator Company, 701 East Gude Drive, Rockville, Maryland 20850. The discount super market for top brand name calculators. Mail and phone orders accepted. BankAmericard and Master Charge accepted.

**SCIENCE & CHEMISTRY**

**DISCOUNTED** Laboratory Chemicals, Glassware-Apparatus. Catalog 50¢. Deluxe Scientific, 507 Huron, Manitowish, Wisconsin 54220.

**CATALOGUE** Of Very Interesting Chemical Products. Formulas, Books, Experiments, Supplies, Surprising Extras. \$1.00. Kenrus-C, Box 205, Staten Island, New York 10306.

**FORMULAS, PLANS, ETC.**

**ANY** Formula \$5.00. Catalog—Manufacturing Treatise \$1.00. Belfort, Box 568, Chicago 60690.

**REMARKABLE, SEE YOUR NAME** Mathematically Equated and Graphed; Scientific Coat of Arms \$3.50. Additional Designs \$2.00. 3KD, Sheldon Co., 4986 Union Ave., San Jose, Calif. 95124.

**PLASTICS**

**CASTOLITE** Pours like water, hardens like glass without heat. Crystal clear, colors. Embed flowers, seashells, mementos, anything. Make fine gifts. Form flexible molds over patterns of any shape, size. Reproduce your own designs in plastics, candlewax, metal, plaster, cement. Profitable. Send \$1.00 for illustrated Manual Catalog. CASTOLITE, Dept. 751/PM, Woodstock, IL 60098.

**LUCITE**—Plexiglas acrylic cut-outs. 10-lb. boxes—1/16" to 1/4" thick. Minimum width—2" Maximum length—12". All clear, paper masked—\$7.50. Mixed clear and colored—\$8.50. Craftics, Inc., 2701 N. Pulaski Rd., Chicago, IL 60639, (312) 235-3307.

**TREASURE FINDERS**

**FIND** Lost Treasure, Coins, Gold, all metals. 12 models from \$59.95. COMPASS METAL DETECTORS, Dept. 705, 3700 24th Avenue, Forest Grove, Oregon 97116.

**TIRED OF DIGGING UP TRASH?** The All New "Coin-Shooter" Rejects Bottle Caps, Tin Foil, Nails and Shallow Trash. Detects Gold, Silver Coins and Jewelry. Free Literature. O-TEX ELECTRONICS, Box 451-U, Garland, Texas 75040.

**POWERFUL** Metrotech locator detect gold, silver, coins, relics. Moneyback guarantee, terms. Free information. Underground Explorations, Dept. A, Box 793, Menlo Park, California 94025.

**BURIED TREASURE**—Locate up to Quarter Mile away with Ultra-Sensitive Directional Locator. Send for free, informative pamphlet. Research Products, Box 13441-AMC, Tampa, Florida 33611.

**FREE FACT-FILLED** Catalog! World's largest selection! Metal detectors starting at \$79.50. Two year guarantee! Three factories, U.S.-Canada, 1,200 dealers—Service Centers nationwide. Finest instruments at any price! Budget terms. Dealer inquiries invited. Write: White's Electronics, Inc., Dept. PASV, 1011 Pleasant Valley Road, Sweet Home, Oregon 97386.

**FIND** Buried treasure with patented metal detectors that distinguish Metallic trash from treasure, have push button and automatic tuning, ground pickup eliminate feature, great range, etc. Free catalogue. Gardiner Electronics, Dept. 9, 4729 N. 7th Avenue, Phoenix, Arizona 85013.

**TREASURE FINDER** Locates buried gold, silver, coins, treasures. 6 powerful models, instant financing available. Write or call for free catalog. Phone (713) 682-2728 day or night. Dealer inquiries invited. Relco, Dept. AA21, Box 10639, Houston, Texas 77018.

**FIND** Buried treasure or sunken treasure at great distances. Write for free literature. Marks Mig., Dept. C-5, Box 838, League City, Texas 77573.

**TREASURE** Hunting Tips; Detector Buying Hints, Both \$1.00. How To Win At Poker, \$2.00. Free Catalog Ghost Town, Treasure Hunting Books. Slocum Books, Box 655A, Simi, Calif. 93065.

**GOLD**

**NOW! FIND GOLD, OLD MINES, BURIED TREASURES, PAN NUGGETS, AMAZING GUIDE REVEALS HOW. DETAILS FREE.** Dave Hunt, Roosevelt, Utah 84066.

**PRECIOUS STONES & MINERALS**

**GET** Free catalog no serious rockhound, gem cutter, jewelry maker, hobbyist or craftsman can be without. Full of bargains, exclusive items, low prices from largest suppliers and authorities in the field. Free new catalog just off the press, yours for the asking. Write: Grieger's, Dept. G-12, 900 South Arroyo Pkwy., Pasadena, California 91105.

**900 POLISHED** Gemstones \$5.00, Tumblecraft, 5401 James North, Minneapolis, Minn. 55430.

**PLASTIC** Casting Supplies, Molds, Jewelry Mountings, Gut Stones. Wholesale Catalog 25¢. Eloxite, 806B 10th St., Wheatland, Wyo. 82201.

**HOT SPRINGS** Diamond send \$1.00, 3 Rota, Hot Springs Village, Ark. 71901.

**CARTOONING, COMMERCIAL ARTS,**

**LEARN** Sign painting at home. Free Talent test. Ben Kerns, Box 812-PM, Greenville, S.C. 29601.

**SIGN** Painting—\$1000 per Month Part-Time. Free Catalogue. Kaufmann Supply, Centertown, Missouri 65023.

**MODERN** Cartooning taught by mail. Write for free brochure. Cartoonorama—Box 263-PMH Branford, Conn. 06405.

**COMPACT** 23 lesson Cartoon Course and Cartoonist's Magazine. \$2.00. Hartman, Box 30367, Lincoln, Nebraska 68510.

**FASCINATING** Systems. Sign Painting-Cartooning. Straley, 1704 South Center, Springfield, Ohio 45506.

**ADVERTISING AGENCIES, ADV. SERVICES, MAILING LIST**

**ADVERTISING** Ratebook leading newspapers, magazines. \$1.00. Chicago Advertising Agency, 28-E Jackson, Chicago 60604.

**MAILING** List, Most all Kinds, \$10.00 per M, 500 Circulans mailed \$7.00, Dixmalters, King, NC 27021.

**MAILORDER ADVERTISERS!!** CLASSIFIED ADVERTISING CAN BE MOST PROFITABLE AND REWARDING. PROBLEM IS TO KNOW WHAT TO DO, WHAT NOT TO DO. COLUMBIA CAN HELP YOU WITH YOUR MAILORDER PROGRAM. OVER 20 YEARS CLASSIFIED ADVERTISING EXPERIENCE, KNOWLEDGE OF BEST PULLING PUBLICATIONS, EXPERT COPY SERVICE IS ALL YOURS AT NO INCREASE OVER PUBLISHER'S STANDARD RATES. CHANCES ARE YOU WILL SAVE MONEY, WRITE TODAY FOR FREE DETAILS PLUS YOUR FREE COPY OF "MAILORDER ADVERTISER'S RATE GUIDE". COLUMBIA ADVERTISING AGENCY, BOX 1285A8, RICHMOND, INDIANA 47374.

**RUBBER STAMPS**

**FREE** catalog—Rubber Stamps—Signature Stamps—Business Cards. Youngers Stamp Shop, Princeton, Iowa 52768.

**3-LINE** Stamps, \$2.50. Signature Stamps, \$5.95. Tabco, Tomkins Cove, New York 10986.

**3-LINE** Stamps \$2.50. Signature Stamp \$5.95, Elasco, 701 1/2 South 75th, Omaha, Nebr. 68114.

**QUALITY** Stamps—3 lines—\$2.50. Business Cards—Catalog. Stamps, 1737 W. Coolidge, Phoenix, Arizona 85015.

**OFFICE SUPPLIES**

**MAILORDER RECORDS** Help get increased business! Complete 32 Page Record Book shows your inquiries, orders, advertising, expense, etc. Only \$1.00. M. E. KAPPEL, POPULAR MECHANICS, DEPT. R, 224 WEST 57TH STREET, NEW YORK, N.Y. 10019.

**PRINTING PRESSES, RUBBER STAMP OUTFITS**

**SIMPLE-X RUBBER STAMP PRESSES**, Hydraulic operated, electrically heated. Sizes 5" x 8", 8" x 12", 10" x 15". Starting outfits. Order for presses, supplies shipped day received. Send \$2.00 for Catalog and brochure. Custom Manufacturers, 2251-P N. Golden, Springfield, Mo. 65806.

**RUBBER** Stamp Manufacturer supplies. Presses, starting outfits. Catalog \$2.00 refundable. Jackson's Supply, Box 443A, Franklin Park, Ill. 60131.

**PRINTING MACHINES**, Offset, Mimeograph, Typewriters, Composing, Machines, Digraph, King, North Carolina 27021.

**NEW** Catalog No. 13, 120 Pages, hand printing presses, type fonts, supplies. Send \$1.00 deductible first order. Acme Type, 732 Federal, Chicago, Illinois 60605.

**SAME** Day shipment on rubber stamp supplies. Revised wholesale price list No. 11 free. Star Stamp Supply, 732 Federal, Chicago, Ill. 60605.

**PRINT YOUR OWN**—Printing Presses, type, supplies direct from factory. Send 25¢ for catalog and samples to: Kelsey Co., DM, Meriden, Conn. 06450.

**PRINTING** Presses, type, Supplies Lists, 10¢. Turnbaugh Service, Mechanicsburg, Pennsylvania 17055.

**RUBBER** Stamp Supplies; Starting Outfits, Martin, 1432 Major, Jefferson City, Mo. 65101.

**SPECIAL 20%** Discount Introductory Offer on our New Custom Size Type Fonts. Buy Direct From Manufacturer—(No Middleman Profit) Type, Presses, Mounts. Barco Type Mfg., 237 S. Evergreen, Bensenville, Ill. 60106.

**PRINTING TYPE**—New, Used, Modern, Antique, Ornaments, Cuts. Free list. Superior, Box 12324, North Kansas City, Mo. 64116.

**PRINTING AND SUPPLIES**

**1000 EMBOSSED** Business Cards \$6.25 Postpaid. Agents Wanted. Elco, 181-A, Sylvania, Ohio 43560.

**NOVELTY** Business cards, Free sample, Empire-PM, 1916 Fifth, Sacramento, California 95814.

**FREE** Literature, Business Cards, Letterheads, Labels, Rubber Stamps. Geer's, 111 North Drive, Ottawa, Ohio 45875.

**\$7.90 YOUR COPY** Reverse of 1000, 8 1/2 x 11 Circulars, your copy black ink. Mailtrade, Box 1302, Springfield, IL 62705. Samples 20¢ stamps.

**FREE** Literature: Rubber Stamps, Books, Business Cards, Printing, Labels. Jordan's, 552 West O'Connor, Lima, Ohio 45801.

**QUICK** Copy Offset Printing. Free Introductory Offer, Nationwide Printing, 614 North Main, Bloomington, Illinois 61701.

**DO-IT-YOURSELF** Mimeo printing. Free booklet for 10¢ postage. Star, POB 1044-PM, Mason City, Iowa 50401.

**YOUR CATALOG PRINTED**—Low as 4¢ for 8 pages, 5 1/2¢ for 16, etc. From camera ready copy. Free sample and prices: Dinner & Klein, Box 21188-B, Seattle, WA 98111.

**ECONOMICAL** Shipping Labels, Forms, Stationery Specials, Samples. Burnin, Weaubleau, MD. 65774.

**SAVE 50%** on Booklets and Camera Ready Printing. Automated Press, 3942-PM, N. Central, Chicago 60634.

**GUMMED LABELS**

**1000 GUMMED** Address Labels \$1.00. Walt's, Box 960A, South Bend, Indiana 46624.

**1,000 GUMMED ADDRESS LABELS \$1.00, FREE LITERATURE**, Acme, 1238 Voskram, Pittsburgh, Pennsylvania 15212.

**1000 GUMMED** Address Labels \$1.00. Scott Wommack, 325 E. Bell, Fairfield, Calif. 94533.

**1000 GUMMED NICE ADDRESS LABELS \$1.00**. CADEAU, DRAWER 4477, BROWNSVILLE, TEXAS 78520.

**REMAILING SERVICE**

**NEW YORK CITY** Remaild 25¢. Box 21, 583 RSO, New York, N.Y. 10031.

**CALIFORNIA** Remails, 40¢, three for \$1.00 including postage. Daughenbaugh, 4660 Rolando Blvd., San Diego, Calif. 92115.

**NEW YORK** Mail Received Forwarded 25¢. Gallagher, P.O. Box 294, Brooklyn, New York 11234.

**ALAMO** City daily remails. Letters only 25¢. Alamo Remail Service, 1723 Donaldson, San Antonio, Texas 78228.

**YOUR** Mail Received, Forwarded. Details Free Westcoast, 1323 Euclid Avenue, M-85, Bellingham, Wash. 98225.

**MIAMI** 25¢. Letters remailed from 130 foreign cities. 300 U.S. cities. Marie, Box 1266, Miami, Florida 33134.

(Continued on next page)



## REMAILING SERVICE

(Continued from preceding page)

**SECRET.** Receiving—forwarding. Discreet and confidential. Remail 25¢ single. Mail Forwarding Service, 8050 S. Main, Houston, Texas 77025.

**DEPENDABLE.** Confidential, Free Information. Harding, 642 LaBrook Drive, Richmond, Virginia 23225.

**CONFIDENTIAL** New York Mail Address \$5.00 Month. Telephone service \$5.00 Remails 25¢. Call Director, 1540 Broadway, Suite 303, New York 10036 212-221-1246.

**YOUR Mail Received-Forwarded.** Hedgpath, 324-M South First, Alhambra, Calif. 91802.

**FREE NASA Viewcard.** Space City Remails, Box 9296PM, HOUSTON, Texas 77011.

**REMAILING**—confidential and dependable—from Freeport, Bahamas, 50¢ Each. Ted's, P.O. Box F-2638, Freeport, Grand Bahama Island.

**CONFIDENTIAL**—Receiving—Remailing—Forwarding. Raven Mt. Enterprises, Box 334, Elizabethtown, N.Y. 12932.

**NEW YORK,** New Jersey, Remails, 25¢, Fahey, Box 159, Malawan, N.J. 07747.

## SPECIAL SERVICES

**TOP Notch Mailing Lists.** Free Details. Community Printing, 1617 Broad St., New Castle, Ind. 47362.

**INFORMATION** On anything. Ferguson Research Specialists, 60-15 Woodside, Woodside, New York 11377.

## BETTER HEALTH

**NATURE'S Answer** Against Cancer, Heart Attack, Arthritis, Diabetes, Cataract. Free Information. Provoker Press, St. Catharines 202, Ontario, L2R 7C9.

**RUPTURE MISERY ENDED EASILY. DRUGLESS HOME TREATMENT. FREE FACTS AIRMAILED.** John Mortimer, Box 608, Victoria, B.C., Canada V8W 2P3.

**LOSE Weight Permanently!** Easy Proven Technique. Copyrighted booklet. Guaranteed! \$2.00. Sunco, Box 915, Chatsworth, Calif. 91311.

**PURE BEE POLLEN** the Scandinavian secret from lush tropical vegetation \$12.00 per 2 lbs. pbd. With every order you get the booklet **POLLEN—SOURCE OF STRENGTH, VITALITY, LONGEVITY.** Postal, money orders only. Clarke Enterprises, 29 Shortwood Rd., Kingston Eight, Jamaica, W.I. Trade inquiries invited.

**LIVE LONGER** Booklet reveals the secrets of a long and healthy life. Send \$1.50. Andrey, 138 McCook Lake, Jefferson, South Dakota, 57038.

**EXERCISE** At Home on build-it-yourself physical fitness equipment, including bicycle exerciser, rowing machine, belt massager, and abdominal board. Send \$5.00 for blueprints B1208 and instructions. Popular Mechanics, Box 1014, Radio City, New York, N.Y. 10019.

## PERSONAL

**TELEPHONE MONITOR!** Records conversations, privately, automatically, using portable recorder. Box 192PM8, Griffith, IN 46318.

**MONEY PROBLEMS?** Solve them! Read "Get Out Of Debt And Have Money To Spare" \$4.00. Thomas Publications, P.O. Box 561, Michigan City, Indiana 46360.

**DIVORCE:** Monthly Newsletter. Valuable Info. Latest court decisions. Support Organization Fighting For You. Beat the Rackel! \$7.50 Year. Men's Rights Ass'n., 2395 University #214, St. Paul, Minn. 55114.

**BUGGED?** New locator finds them fast. Write Clifton, Box 220-P, Miami, Florida 33168.

**BECOME** An ordained minister. Free ministerial credentials legalize your right to the title "Reverend." Write Church of Gospel Ministry, 486-P Skyhill Court, Chula Vista, Calif. 92010.

**NEW Scientific Way** to predict your future. Details... J. Martin, 5459 Coolbrook, Montreal, Quebec.

**PSORIASIS SUFFERERS: DISCOURAGED?** Write for free important information that is helping thousands. Pixacol, Box 29277-PM, Parma, Ohio 44129.

**NEED Money—Debts Too Big?** Consolidate Bills, "Quick-Cash" Emergency Loans Available. Helmed Thousands since 1936. Free Application. Interstate, 28 E. Jackson, Suite 1204-X3, Chicago 60604.

**BIBLE** Questions answered. Stamped envelope. Bylon, 17167 Bentler, Detroit, Michigan 48219.

**RECORD** Telephone Conversation automatically. Leave Recorder Unattended. Robert's, Box 49-PM8, Parkridge, Illinois 60068.

**ARE YOU STILL PAYING TAXES?** Be President of your own tax-exempt Church or other non-profit Corporation. **FINANCE YOUR DREAMS.** Get Foundation grants. Free details. TOU-PM8, 6311 Yucca, Hollywood, California 90028.

**ESCAPE** From debts and bill collectors! Have AAA-1 credit everywhere. Free report reveals secret plan! Credit 448, 333 North Michigan, Chicago 60601.

**UNEMPLOYMENT** Insurance. Collect every nickel. Detailed Instructions. \$2.00. Clifton, Box 220W, Miami, Florida 33168.

**YOU WILL NOT DIE** Without a will for you will have a perfect will when you send \$2.00 for do-it-yourself

**WRITE Your WILL** quick easy! 4 will forms. \$2.50. Included **FREE** Attorney Instructions, Asset List, Executors Duties. Guaranteed! Order today!! Postform, Dept. 1A8, 2026 Appleton, Long Beach, Calif. 90803.

**WRITE Your Will.** Quick, Easy, 4 Will Forms. Attorney's Instructions. Moneyback Guarantee. \$2.00—Marion, 2609PM8 Tilbury, Pittsburgh, Pa. 15217.

**FEEL BETTER!** Easy, Common Sense Diet Program. \$1.00. Jon Dee Associates, 7610 Penn Avenue South, 218E, Richfield, Minnesota 55423.

**STOP SMOKING!** Tested Proven Method. Money Back. \$2. CRASET, Box 10541, Denver, Colorado 80210.

**HOW** To Improve your psychic way to success, wealth, love and peace. Send \$6.98 to: F. L. Hampton, P.O. Box #18315, Seattle, Wa. 98118.

**TELEPHONE** Recording, Debugging, Security Equipment. Factory Direct Prices. Top Quality. Viking International, P.O. Box 632M2, Newhall, California 91322.

**STOP SMOKING!!** Save Money!! No Drugs!! 4-Step Formula Shows YOU how. Guaranteed. Send \$2.00. S. Bratkovich, (Dept. 8-1A), 1501 W. Farwell Ave., Chicago, Ill. 60626.

**BALDNESS & Hair transplant**—Send for the only documented information—researched 19 yrs. Easy to read—Clinical procedure—Availability of Drs. \$3.75 M.O. Hair, 4050 So. Fox, Englewood, Colo. 80110.

**LOOK Younger.** I Am Judged 10 Years Younger than I Am. Learn My Secrets, Three Vitamins I Take, Special Foods, How I Clean My Face And Hair, Much More. \$5.00. "Secrets" P.O. Box 711, Metairie, Louisiana 70004. Moneyback Guarantee.

## SOCIAL SECURITY PLATES

**GOLDEN ENGRAVED SOCIAL SECURITY** Plate with case \$2.00. Cloverleaf, Box 49, Selbyville, Del. 19375.

**BICENTENNIAL** and Zodiacs Social Security Plates—\$2.00 In Case. If Zodiac Send Birth Date. John Shrader, Route 1, Dandridge, Tenn. 37725.

## WANTED MISCELLANEOUS

**MERCURY** Gold, Silver, Platinum: Ores assayed. Wholesale Terminal, Norwood, Mass. 02062.

## WINEMAKING & OTHER RECIPES

**WINEMAKERS** Free Illustrated Supply catalog of yeast, equipment. Continental, Box 68016-PM Indianapolis, Ind. 46268.

**WINE.** Old German Family Recipe Simple to make \$2.00. Moore, Box 35, Cherryville, Mo. 65446.

**MONEY** Wine organic \$2.00 for recipes. C & B, P.O. 114, Mt. Vernon, WA. 98273.

**WINEMAKING** Instructions \$1.00. Ron Kelly, 25 Shadow Road, Melrose, Mass. 02176.

**BETTER** Wines and Champagne. Kitchen Vessels used. Booklet \$1.98. J&L Place, Box 773, Tatum, Texas 75691.

**NEW! TAMALES**—Easy—How-to Photos—\$2.00—Martinez, Box 621, Santa Fe, N.M. 87501.

**WINEMAKING.** Yozuri, Cheesemaking. Free catalog. Arbolyn, Box 663, West Columbia, S.C. 29169.

**WINEMAKER'S** Supply Catalog—Free. Bacchanalia, 273 Riverside Ave., Westport, Conn. 06880.

**WINEMAKERS.** Free Illustrated catalog of yeasts, equipment. Semplex, Box 12276R, Minneapolis, Minn. 55412.

**WINEMAKERS** Free Informative Catalog. Yeast Equipment, Ingredients, **DANENBERGER'S**, Box 276-M, New Berlin, Ill. 62670.

**NEW! . . . FREE CATALOG . . . 30 VARIETIES FRUIT & GRAPE CONCENTRATES . . . 100 WINE & LIQUEUR FLAVORS.** Complete line of Winemaking Supplies. Kraus, Box 451-L, Nevada, Missouri 64772.

**FREE** Advice Anytime!!!—With "Homewinemakers"—"Easy Methods Recipes Book"—Satisfaction Guaranteed \$3.00. Jesse's Research, 240 Roberts Road, Plumboro, Pa. 15239.

**SAVE MONEY!** Make Gallons of Wine for pennies using frozen grape concentrate. Send \$2.00 for recipe: Forrest Ventures, Inc., Box 780, Mocksville, N. C. 27028.

**WINEMAKING!** Champagne! Beer! Easy, Delicious, Inexpensive, recipes Guaranteed!! Gary Sales, 1N577 Gloria, W. Chicago, Illinois 60185.

**WINE, CHAMPAGNE, BEER, FINEST RECIPES \$1.00. BEVERAGES, 33 CEDAR ST. SOUTH, KITCHENER, ONTARIO, CANADA, N2G 3L4.**

**AMAZE** your friends! Serve your own created table wine at dinner—for pennies a bottle. Details free. Treasure House, 1668-A Thompson Avenue, East Point, Georgia 30344.

**FINEST** Wines . . . Champagne . . . Make At Home . . . Use Kitchen Utensils . . . Send \$2.00 . . . Quality Products. Box 2118, Monroe, Wisc. 53566.

**MAKE** Wine and Champagne at home using kitchen utensils. Includes **FREE BONUS** which contains recipes to make beer. Guaranteed. Send \$2.00. S. Bratkovich, (Dept. 8-1D), 1501 W. Farwell Ave., Chicago, Ill. 60626.

## MISCELLANEOUS

**FREE!!** 100-Card Bible Game: Biblegame, 5837 Stewart, Sylvania, Ohio 43560.

**HEARING** Aid batteries wholesale. Free list. Habs,

**SPECIAL!** Don't Die without a WILL! Blank will, protects, your family. Bonus! Your engraved, gold plated **SOCIAL-SECURITY** plate. SEND \$3.00—. "Self Correcting" **TYPEWRITER-RIBBON** \$3.00. Mallico, Box 11401A, Portland, Oregon 97211.

**CHECKER PLAYERS,** improve your game, get "26 WAYS TO TRAP YOUR OPPONENT" \$2.00. Checks-Pro., Box 819, Tullahoma, TN. 37388.

**IDENTIFICATION CARDS,** Birth Certificates, Diplomas, Legal Forms. Samples 25¢. Publication, Box 26062T, Los Angeles, Calif. 90026.

**FLY-GONE** Kills Flies By Thousands, \$3.95 Postpaid. Universal, Lenora, Kansas 67645.

**4 WHEEL** Drive, Build your ATV from readily available material (it works). Info Pak \$5.00—Plans \$20.00. Bulldog Engineering, 509 Industrial Ave., Boynton Beach, Fla. 33435.

**BOOKS** On antiques and their prices. Free circular!! P. Warman Publishers, Uniontown, Penna. 15401.

**DON'T** Die Without A Will! Protect Your Family. Quality Will Forms (2) Only \$2.00—Guaranteed. Order now! AJG, 12446 Otsego, Dept. 1C8, No. Hollywood, Calif. 91607.

**ORNAMENTAL** Iron designs. Book of 1600 beautiful, practical designs for railings, columns, etc. Free literature. Cunningham, 3881 South 3200 West, Box 29005, Salt Lake City, Utah 84120.

**IDENTIFICATION CARDS.** Send stamped self-addressed envelope for samples. NIPCOM, 727 North Main, Las Vegas, Nevada 89101.

**WIN!** Casino Games! Free Details! Xolito Games, 5715 N. Mozart, Chicago, Illinois 60659.

**ROLL** Your own Cigarettes with American Blend or Menthol Tobacco. Cigarette Makers and papers available. For free Tobacco sample write Green River Tobacco, Box 1313M, Owensboro, Ky. 42301.

**HORSEPLAYERS**—Free!!!! How Turfwin Won \$300 Weekly. Guaranteed! Turfwin, Box 581 PM8, Port Washington, N.Y. 11050.

**HOW INTELLIGENT** Are you? Self-scoring test reveals I.Q. in 45 minutes! Send \$2. today—Guaranteed! Motivational Publications Dept. 115C, Box 7147, London, Ontario, Canada.

**DECLARATION OF INDEPENDENCE** Reproduced on antique parchment, 11"x15". Educational, decorative. Moneyback guarantee. \$2.00 (check or cash): Documentaria, Box 81245, Atlanta, Georgia 30341.

**DRAIN KING** Open Clogged Drains fast with Household Pressure Water—\$4.95. H. Helton Sale, 4132 Washington, St. Louis, MO. 63108.

**SENSATIONAL SELF CORRECTING TYPEWRITER RIBBON!** \$3.50. Specify Typewriter Brand Name, Make, Model. SLM Sales, Box 3226, Dept. 1-H, Evansville, Ind. 47731.

**AERONAUTICAL** Engineer's Booklet "Can God Be Proved Mathematically?" Amazing Equation Demonstrates How! \$2.00. Bachler, Stanhope, Iowa 50246.

**BICENTENNIAL:** American Flag Night Light; Only \$3.95 plus 75¢ Mailing, handling; Patriotic Emblems; 11023 No. 45 Drive, Glendale, Arizona 85304.

**LAS VEGAS CALLING.** . . . The sensational version of the **ONE ARM BANDIT** that really works. Insert coin, pull lever and release. Automatically pays off, if you win. Great for Home, Bar, Office or Den. 2 Models available. For free details write to: House of **TORSTEN**, Dept. PM-8, 4636 West 103 Street, Oaklawn, Illinois 60453.

**BICENTENNIAL** Crosswords, Informative special edition \$3.45. Fleck, 29-PM Colonial, Roselle, NJ 07203.

**ANSWER** After years of Research!!! Thoroughbred Racing by California Professor, this is not a System, just hard work research and results, for information enquire. Wallace, 2499P Fairway Drive, Costa Mesa, California 92627.

**WIN CONTESTS!!** easy method gives seldom revealed secrets. Guaranteed. Send \$2.00. S. Bratkovich, (Dept. 8-1C), 1501 W. Farwell Ave., Chicago, Ill. 60626.

**BEAT BLACKJACK!!!** New Powerful method guarantees winning. Free Information. Sheridan, 7730-A Fair Avenue, Sun Valley, California 91352.

**PRESCRIPTION EYEGLASSES.** Free Catalog. A-Z Optical Company, Box 175, Dept. R26, Bay Station, Brooklyn, New York 11235.

## BURGLAR ALARMS & HOME PROTECTION

**PROTECTION** From moochers—free labels! 25¢ handling—Dawn, Box 3016, N.Y., N.Y. 10001.

**PROTECT** Your Home! Security Alarm System Warning Decals—Professionally Engraved—Virtually fool-proof against Burglars! Three Decals—\$2.00, six for \$3.00. Satisfaction Guaranteed. Nationwide Enterprises, Dept. B8, Box 56181, Atlanta, Ga. 30343.

**DIALING** Unit automatically calls police. \$29.95. Free literature. S&S Systems, Box 123750, North Kansas City, Mo. 64116.

**FIRE AND SMOKE DETECTOR**—Homes and Private Dwellings. Details Free. Write: Old Germantown, Dept. 12-0E, Freelandville, Ind. 47535.

**BURGLAR**—Fire Alarm, Supplies and Information. Free Catalog, Protecto Alarm Sales, Box 357, Birch Run, Michigan 48415.

**FREE** Catalog On Burglar-Fire Alarm Equipment. Vancor Security Systems, Box 438-P, Boston, Mass. 02144.



# ONE DOLLAR

Announcing: The most incredible magazine subscription offer of all time: 10 weeks of **Moneysworth**—the authoritative, scintillating, wallet-fattening newspaper on money that has inspired 2,000,000 passionate devotees—for the crazy giveaway price of **ONLY ONE DOLLAR!**

That's right, just pop a dollar bill into an envelope, with the coupon below, and we'll send you 10 weeks of such inflation-defying, high-interest, Midas-touch articles as:

Earn 12½% on Your Savings  
Air Travel at 50% Off  
States with Best Unemployment Pay  
Prosperity in Alaska  
The Amazing new Two-Engine Car  
Today's Soldiers Command High Pay  
Cars that Are Stingiest with Gas  
Low-Cost Insurance for Non-Smokers  
Checking Accounts that Pay Interest  
Buying Prescriptions at Cut-Rate  
Where Retirement Benefits Go Far  
How Mrs. Rockefeller Practices Thrift  
The "Yurt": Incredible \$350 House  
Scholar Dollars for the Middle Class  
Don't Sneeze at This Cold Remedy  
Deductible "Do-Good" Vacations  
Sugar at 9¢ Pound  
Get 7 Bestsellers for the Price of 1  
VW Gets the Jump with Its Rabbit  
Buying a Guitar You Won't Fret Over  
Picking the Best Looks  
Trimming the Cost of a Haircut  
Fake Meat Can Be a Real Value  
Hail the Checker Cab!  
Cookware that Won't Go to Pot  
How Doctors Diet  
Is Cancer Contagious? New Findings  
Legal Ways to Beat Sales Taxes  
The Nickel Phone Call Rises Again  
More Proof that Vitamin C Works  
The A.A.A. Is a Bad Trip  
Coming: Edible Newspaper  
Miami's New Secret "Swiss" Banks  
World's 100 Best Free Calendars  
Sailboats that Are Winners  
Compactors Belong in the Garbage  
Brando's New Resort is a Wild One  
The Case for Shucking Off Clams  
Prostitutes Laid Low by Inflation  
Face-Peeling Is a Rip-Off  
Cocaine's Effect on Potency  
Bittersweet News About Saccharine  
Longevity Linked to Light Eating  
Farewell to Flatulence  
Coming: Staggered Tax Deadlines  
Alfalfa: Superfood for Man  
Contraceptive Foods  
Holding the Line on Phone Costs  
Bella Abzug's Nutball New \$2 Bill  
Illuminating Rating of Light Bulbs

In short, **Moneysworth** is a live wire sparking off hot information on the current money scene. It galvanizes readers all over the country into sending ardent letters like these:

• "The government has proven itself completely impotent in the fight against inflation. My only salvation comes from advice I find in **Moneysworth**. It save me as much as I lose through inflation."—*Theresa Ramsler; San Francisco.*

• "Your article on the 15% interest paid by Mexican banks has made it possible for me to retire in style."—*Eric T. Svenson; Fallbrook, Calif.*

• "Thanks to **Moneysworth**, I am \$5,417 richer. I battled the Social Security Administration unsuccessfully for 18 months, then finally won out by following the advice of your article 'By All Means, Appeal'."—*S. Dominguez; Waterbury, Conn.*

• "Your article on airfare 'triangular' routes was an astonisher. My wife and I saved \$100 each on a trip to New York by stopping off at Las Vegas as you suggested."—*H. Kesselman; Los Angeles.*

• "Boys, you are not going to believe this, but I have parlayed \$146 into \$90,000 thanks to your informative article on breaking into real estate."—*Horace T. Pinrose; Montgomery, Iowa.*

• "Your write-up on income averaging for tax purposes saved us \$1,100 this year. We didn't realize retirees could do this."—*Mr. & Mrs. J.W. Long; Morro Bay, Calif.*

• "We salute **Moneysworth** for its excellent report on our free sex-counseling-by-telephone service. As a result of it, we've received calls from all 50 of the United States—including Hawaii and Alaska—and even a few from Europe and Africa."—*Community Sex Information; Boston; (617) 232-2335.*

• "Your recommendation that readers reduce orthodontic bills by having the work done at a university dental school saved me \$1,350 on my daughter's teeth."—*Bob Walters; Oxon Hills, Md.*

• "Your tip on flying to Europe via Afghanistan saved me \$450. You've made me a subscriber for life."—*Charles B. Fager, M.D.; Harrisburg, Pa.*

• "Your advice on Social Security resulted in a \$3,135 lump-sum cash payment to my wife, and \$171 monthly pension. The best investment I ever made was a subscription to **Moneysworth**."—*Dr. Herman W. Hortop; La Grange, Ill.*

• "As a result of your article on nonprofit, low-cost memorial associations, we have been receiving 400 inquiries per day. You'll get an inkling of the immense amount of money your subscribers have saved when you realize that each of our members saves well over \$1,000 on a

funeral."—*R.J. Stevens, President, Continental Association of Funeral and Memorial Societies; Chicago.*

• "Your tip about deducting the cost of transportation between my two teaching jobs saved me in taxes at least the cost of a ten-year subscription. Not only that, but your publication is lively, off-beat, a delight to read."—*Professor Reuben Garner; State University College; Brockport, N.Y.*

• "Thanks to your article 'How to Buy a New Car for \$125 Over Dealer's Cost,' I just bought a Chevy at a saving that I estimate at \$350."—*Ron Bromert; Anita, Iowa.*

• "Your article 'Inaccurate Billing by the Phone Company' led me to discover four years of overcharges. I got a \$1,593 refund."—*Armand DiRienzo; Bristol, Pa.*

• "**Moneysworth's** product ratings sure stretch the dollar. I bought the Canonet 35MM rangefinder camera you recommended, and saved 30%."—*R. Goodrich; Tucson, Ariz.*

• "Your article 'How to Fight a Traffic Ticket' saved me a \$200 lawyer's fee and a ticket."—*W.R. Wendel; Hicksville, N.Y.*

• "Your article 'How to Avoid Paying an Exorbitant Doctor Bill' saved me \$65."—*Carl Wagner; Yorktown Heights, N.Y.*

• "Your expose of charity rackets was a shocker. I've crossed several well-known organizations off my list, saving hundreds of dollars."—*Freida McMullin; Steilacoom, Wash.*

• "Your article on how to save \$100 on a color TV worked. **Moneysworth** sure knows how to hold onto the green."—*P. Allen; Dir. Student Union; Henderson College; Arkadelphia, Ark.*

• "Your article on 'coupon refunding' got my husband and me hooked on the hobby. It saves us enough each year to pay for our vacation."—*Grace Ellen Feingold; Brooklyn, N.Y.*

• "By ordering cigarettes from Wilson, N.C., as **Moneysworth** suggests, I have cut my smoking expenses in half."—*R. Panlewski; Chi.*

• "Your suggestion that readers buy \$200-deductible car insurance instead of the usual \$50-deductible saved me hundreds of dollars. Insurance salesmen hate like hell to sell it because there's little profit in it for them, but it sure saves me money."—*Gary W. Goodwin; Sunland, Calif.*

• "For years I had always been the victim of greedy car mechanics till **Moneysworth** steered me to Jimmy's Service Station in Guttenberg, New Jersey. My old '66 Ford now runs much better than most new cars and the amount of money Jimmy has saved me—compared with estimates I've gotten from other mechanics—is unreal."—*Mrs. Dorothy Tyborski; Secaucus, N.J.*

• "You sure did us a good turn recommending Mayflower for our move from California to Minnesota.

Would you believe the bill was a hundred bucks under the estimate?"—*D.J. Ganster; Owatonna, Minn.*

• "Upon **Moneysworth's** advice, I asked the phone company for an itemized bill. As a result, I discovered that for years I had been paying for a nonexistent extra line. Result: A \$550 refund. My trial subscription has paid for itself 110 times over!"—*George Petsche; Washington, D.C.*

• "Because of savings you just helped me make on a new car, I calculate that I can subscribe to **Moneysworth** for forty-six years and the subscription will be absolutely free. You're marvelous!"—*Mrs. J. Wilson; Philadelphia, Pa.*

• "**Moneysworth's** investment news dispatches enabled me to make over \$2,200 in less than a year. Yours is one of the most intelligent, down-to-earth, to-the-point periodicals I've ever read."—*Ruth Pantell; Yonkers, N.Y.*

• "Your article on TV game shows gave me confidence to try for 'The \$10,000 Pyramid.' I won \$850!"—*Ted Zammit; Franklin Square, N.Y.*

• "Your suggestion that I use a fake name in the phone directory, instead of paying \$1 per month for an unlisted number, alone pays for my **Moneysworth** subscription several times over."—*C.B. Russel; N.Y.C.*

• "Your report that dentures cost only \$40 at the Sexton-Shealy Dental Clinic of Florence, South Carolina, saved me hundreds of dollars. They fitted me up in 24 hours and I completed the entire procedure during a vacation to Florida."—*Mrs. H. Petruccio; Frackville, Pa.*

• "**Moneysworth** is aptly named. To paraphrase Churchill, 'Never have so many paid so little for so much'."—*D. Alpern; Pittsburgh, Pa.*

As you can see, reading **Moneysworth** is the next best thing to being born rich. It is absolute protection against the ups and downs of economic fortune.

The price of a 10-Week Special Cut-Rate Introductory Subscription, as we said, is **ONLY ONE DOLLAR!** That's right, only one buck, smacker, greenback, simoleon, boffo, bean, eight-bit, frogskin, lettuce leaf, shinplaster.

Get it on! Place your order by simply filling out the coupon below and sliding it into an envelope with a dollar bill. Mail it to: **Moneysworth, 251 W. 57th St., New York, N.Y.**

Don't miss out on publishing's greatest single offer.



MONEYSWORTH, 251 W. 57TH ST., NEW YORK, N.Y. 10019

I enclose \$1 for a 10-week subscription to the wallet-fattening fortnightly **Moneysworth**.

**EXTRA BONUS OFFER:** Check this box ☐, enclose \$2.99 and get **THIRTY-TWO** weeks of **Moneysworth** PLUS a copy of the booklet all of America is talking about, "Stake Your Claim! How to Work the Social Security Gold Mine."

Name

Address

City  State  Zip

Legal notice: © Moneysworth moneys. Trademark registered U.S. Patent & Copyright Office. Real names and localities have been used in testimonials except insofar as written permission to quote had not been received at this ad was sent to the printer. All circumstances, statistics, claims, etc., are completely true. 7G\*





## Excalibur Liquid. The paste wax that pours.

For the first time, a liquid wax has been developed with all of the unique characteristics of our finest paste wax.

So steadfast, so luminous, so nobly formulated, we've felt not the slightest compunction about knighting it with the most aristocratic name in motorcar wax—Excalibur.

Excalibur Liquid is painstakingly blended from the costliest ingredients—precious Carnauba, high molecular weight polymers, microscopic silica diatoms and special silicones.

So now, alongside Excalibur paste wax stands Excalibur Liquid. And now you have your choice of the choice.

**New. From the House of Turtle Wax.**



Of all filter kings tested:

# Carlton is lowest.

Look at the latest U.S. Government figures for other brands that call themselves low in tar.

	tar, mg/cig	nicotine, mg/cig
Brand D (Filter)	15	1.0
Brand R (Filter)	14	0.9
Brand K (Menthol)	13	0.8
Brand D (Menthol)	13	0.9
Brand M (Filter)	12	0.8
Brand T (Menthol)	12	0.7
Brand V (Filter)	12	0.8
Brand V (Menthol)	11	0.8
Brand T (Filter)	11	0.6
<b>Carlton Filter</b>	<b>4</b>	<b>0.3</b>
<b>Carlton Menthol</b>	<b>4</b>	<b>0.3</b>

Carlton 70's (lowest of all brands)—  
2 mg. "tar", 0.2 mg. nicotine



Warning: The Surgeon General Has Determined  
That Cigarette Smoking Is Dangerous to Your Health.

Filter and Menthol: 4 mg. "tar", 0.3 mg. nicotine av. per cigarette, FTC Report April '75.